POPULAR Computing WEEKLY

35p

1-7 March 1984 Vol 3 No 9

40 Rock (C)

BRITAIN'S BEST-SELLING MICRO WEEKLY

CLASSIFIEDS START HERE



Computer Swap 01-437 4343

Free readers entries to buy or sell a computer.
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SWAP MY Dragon 32 with £500 of software and tape recorder for BBC Model B with software. Paul Hughes 25 Clarke Road Borras Park, Wrexham, Clwyd North Wales LL12 7TY

DRAGON 32 Demo Cartridge wanted or any defective faulty cartridge. Tel Staines 58707 (after 6pm)

★ STAR GAME ★
Sea Attack on BBC
See page 10

News Desk



Sinclair interest builds up

SINCLAIR has now admitted that interest from cheques cashed for unfulfilled QL micro orders will "ultimately accrue to the company."

Over 9,000 waiting customers have now been told that they will not receive their QL computers until the end of April. Those who have placed more recent orders have been told not to expect delivery before the end of May.

Around half of the orders placed have been accompanied by cheques which have now been cashed. Credit card orders cannot be encashed until the goods are delivered. By the end of April, Sinclair will have had control of around £1.8m of customers' money in a 'Readers Trust Account' for over two months earning the company some £32,000 in interest — around £6.50 per order cashed. A Sinclair spokesman, asked if he thought this was fair commented: "I do not think I am in a position to answer questions concerning ethics."

He said that all advertisements for the QL still planned have either been cancelled or

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Timex pulls out of US market

TIMEX is to withdraw from the US home computer market.

Its computer division is to be dismantled and it will cease selling its range of computers designed by Sinclair — the TS1000 (ZX81), the TS1500 (a 16K version of the ZX81) and the 2068 (the 48K Spectrum equivalent).

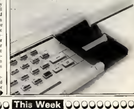
Timex thus becomes the third major computer manufacturer to fall victim to the vicious US home computer price-war following Texas Instruments and Mettel.

Announcing the company's withdrawal C Michael Jacobi vice president of marketing and sales said: "We believe that the instability in the home computer market will cause prices to continue to fall during 1984, making it difficult to make a reasonable profit."

Timex will however continue as a computer manufacturer.

Shortly prior to the Timex announcement last week, Sinclair's managing director Nigel Searle flew to the US for talks with Timex. Following his dis

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The Team

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This Week

Editorial

Timex's hasty retreat from the US home micro market comes as no surprise The company has consistently refused to release sales figures of its TS2068, but it is no secret that very few machines have been sold

Instead of releasing a US version of the Spectrum immediately after its launch in the UK, Timex spent months attempting to improve the Spectrum's design The result was that orders for the ZX81 and the TS1000 dried up while Timex had no machine to replace them When the TS2068 finally made its debut, dealers and customers had already switched to other machines which were readily available

The final nail in Timex's coffin was Sinclair's announcement that it was going to market the QL in the US itself not through Timex With no immediate prospect of an uplift in sales, and no upmarket micro to continue the range Timex decided to cut its losses and follow Mattel and Texas Instruments in pulling out of the home market.

This move undoubtedly leaves Commodore in an even stronger position, though the recent departure of Jack Tramiel still leaves some question marks against the company

Sinclair, however, is left with no computer sales in the US until the QL is ready for launch Judging from experience in the UK so far, the QL is unlikely to appear in the US for some considerable time

Next Thursday

Next week's star game is Showdown for 48K Spectrum by Andrew MacCade — shoot your opponent first but avoid the cacti and falling tombstones

Timex

continued from page 1

cussions with senior Timex management Sinclair has now announced that it has no plans to market the Timex machines or, indeed, to sell a direct conversion of its successful Spectrum in the US

A spokeswoman for Sinclair commented "The home computer marketplace is still very shaky over there "

The news is not just a blow to Sinclair, but also a set-back for the many British software houses preparing to sell 2068 versions of their Spectrum material in the US

One of the hardest hit companies will be Psion Its *Vu-File*, *Vu-Calc* and *Vu-3D* programs and its three *Horace* titles were all being marketed by Timex for the 2068 Melbourne House will be affected as will Softsync, an American house Software from companies like Psion being marketed by Timex will either continue to be sold by Timex or sold off to other US software houses Quite who will buy and market software for a machine which has now been discontinued is unclear

Mark Eyles, speaking on behalf of Quicksilva which launched its American subsidiary less than two months ago said "Obviously it will affect us, but when we set up our US company we were very careful not to rely on a single machine — we have a very respectable range of Commodore 64 software on sale out there as well as our Spectrum material

"It is sad that Timex has given up — lots of British companies spent a great deal of time and effort trying to support Sinclair out in the US and it looked like it was just beginning to take off We will just have to hang on and wait for the QL "

Sinclair too will presumably be hanging on till the QL goes on sale in the States The company plans to sell its QL machine by mail-order with American deliveries beginning in the late Summer

It remains to be seen how much the Timex collapse will influence sales of the QL The Sinclair spokeswoman commented "We do not believe that the problems in the US home computer market affect products in the price range of the QL "

Timex's difficulties first began in January 1983 when it showed a Spectrum at the Chicago CES Show Sales of the ZX81 equivalent immediately slumped and it was not until November that the 2068 appeared in a modified form in American shops By that time, stores which had been caught with surplus stocks of the ZX81 could not be persuaded to take the new machine

QL interest grows

continued from page 1

altered to change the 28-day delivery claim On Friday, Teledata was still offering a 28-day QL delivery schedule

"Everyone whose money is in that Readers Trust Account is fully aware of the situation,' explained the spokesman "and has been given a full option to cancel their order "

● *PCW's* QL order week six No sign of our QL It is now two weeks since the 28-day mail order deadline Our cheque was cashed two weeks ago, from which Sinclair should have gained around £1 45 in interest

Software authors

THE Computer Trade Association is to set up a sub-group — The Society of Software Authors

The inaugural meeting will be held on Saturday May 5 at the Kenneth More Theatre, Oakfield Road, Ilford, Essex, beginning at 1pm

Initial membership has been fixed at £10 per year More details from Ms D Cox, The Society of Software Authors, 7 Meadway Court, Whalebone Lane South, Dagenham, Essex

GOSH condemns MoD ban

THE Guild of Software Houses (GOSH) has reacted quickly to condemn the Ministry of Defence's action in banning a software protection device (see *PCW* 16-22 February)

"It seems outrageous that the government is, by this action, endorsing and giving actual support to computer pirates", commented GOSH chairman Nick Alexander

"If the JLC system does work and the MoD refuse to release it, then the government should compensate the games industry for the £100m it is estimated is being lost due to piracy "

Whistle Test

WHISTLE Test — the BBC-2 rock show — takes a look at computer music this Friday, March 2, at 11 35pm

Acorn centre in Silicon Valley

ACORN has announced it has set up an advanced research centre in Silicon Valley in the US This follows Acorn's move into the American market last year and the setting up of a US subsidiary, Acorn Computer Corporation

The company has also announced profits for the whole group for the six months to January 1, 1984 up 156 percent to £5 21m This despite incurring £2 5m costs to set up its US operation

During the same period, turn-over also increased from £14 39m to £40 4m

Despite acute manufacturing problems with the Electron computer — few retailers have yet to receive more than a few machines — the BBC micro continues to sell well

It's a mugs game

MELBOURNE House's next adventure game is *Mugsy* which will be released before *Sherlock Holmes*

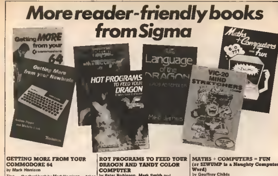
Mugsy is set in a Chandleresque world of gangsters, molls and organised crime As an aspirant gangster you attempt to take control of the neighbourhood by bribing corrupt officials and, inevitably, killing rival gang bosses.

The program, which Melbourne House are calling an adventure/strategy game, has three sections of cartoon-quality graphics which form 'playlets', acting out events within the game One features a street scene a girl walks by, a man reading a newspaper turns and follows her, a black limo pulls up and suddenly the window from which you have been observing the events is covered with bullet holes

In other sections of the game characters speak with balloon bubbles, as in a comic strip, and there is also an arcade style section

The game is expected to be released in late March, initially for the 48K Spectrum but quickly followed by a Commodore 64 version Both will sell for £6 95

● *Sherlock Holmes*, the long awaited follow up to *The Hobbit* is now expected in late May



GETTING MORE FROM YOUR COMMODORE 64
by **Mark Harrison**

This — the third book by Mark Harrison — takes you beyond the Commodore manual and shows you how to use your 64 to the full. The book is a complete introduction to computing, covering how the 64 and other computers work, programming in Commodore BASIC, using the 64's dazzling graphics abilities, sound and advanced concepts. The latter includes use of the Commodore Printer and Disk Drives, disk files and data processing.

0905104 595 | *316pp* | *£8.95*

COMPUTING FOR ALL THE FAMILY WITH A BBC COMPUTER
by **Tony Noble**

Tony has taught computing to himself, his family and the children at his school, so there is no one better placed to write this THE definitive computer book for either school or home use. It begins with an introduction to the uses of microcomputers then takes you through about 50 short simple easy to follow steps that take you from turning on the computer to advanced BASIC programming.

0905104 587 | *298pp* | *£6.95*

GETTING MORE FROM YOUR NEWBRAIN
by **Andrew Pepper** and **Michelle Clark**

Andrew Pepper and Michelle Clark guide you through the Newbrain's capabilities and a BASIC programming course and then into specifics — how you can exploit its 32K of RAM and excellent interfacing and expansion facilities, saving and retrieving programs, datatypes, Newbrain Streams, control statements, numbers, arrays, strings, graphics, programming discipline and the Newbrain operating system.

0905104 676 | *144pp* | *£7.90*

HOT PROGRAMS TO FEED YOUR DRAGON AND TANDY COLOR COMPUTER
by **Peter Robinson, Mark Smith** and **Niel Biscow**

This book contains not only the best programs for your Dragon (or Tandy Color Computer) but also a full description of how the programs work, how you can change them and how you can produce your own programs. This is not a collection of simple games, there are plenty of smaller books on that subject — the emphasis is instead on quality. The book divides naturally into four sections: Advanced Games, Sound and Graphics, Business and Utilities.

0905104 51 X | *162pp* | *£8.95*

LANGUAGE OF THE DRAGON
6809 Assembler
by **Mike James**

This companion volume to *Advanced BASIC for the Dragon* aims to teach 6809 assembler language to anyone with only a previous knowledge of BASIC. Each chapter includes examples and many "cookbook" style routines for immediate use by the reader who will then be able to write programs in assembler language that are faster than BASIC programs. This is particularly important for high speed 'arcade' style games programs.

0 905104 36 6 | *242pp* | *£6.95*

VIC-20 MINDSTRETCHERS
by **Ian Creasey**

Feel like paying £10 for just one program? Forget it! In this book, there are 30 programs ranging from exciting video games such as *Bomber*, *Alien Attack* and *Munchers* right through to games of strategy and programs that will make your life as a programmer that much easier. To help you increase your own programming skills Ian Creasey includes a comprehensive section on creating your own programs.

0905104 692 | *114pp* | *£5.95*

MATHS + COMPUTERS = FUN
(or SZWUMP is a Naughty Computer Word)
by **Geoffrey Childs**

Most children and many adults find mathematics to be a hard topic. It need not be so, and Geoffrey Childs (an experienced teacher) has written this delightful book to show that it can be fun. It contains numerous aids to learning those difficult topics, many anecdotes and entertaining puzzles. The programs run immediately on a Sharp MZ 80K or MZ 80A but conversion notes are included for owners of Sinclair, Apple and Tandy machines. Conversion to other machines is a simple task.
Each section has numerous programs with dazzling graphics and sound to encourage the young users. There are over FIFTY programs included in the book. The programs are all available on cassette for those not wishing to type them in.

0 905104 33 1 | *274pp* | *£6.25*

Σigma Technical Press

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COMPUTER BOOK MONTH MARCH 1984

The books featured in this advertisement, along with many other titles and software packages, will be on display in leading bookshops and computer stores during March as part of the 1984 COMPUTER BOOK MONTH
For a copy of the checklist please write to Annabelle Duckit, John Wiley & Sons Ltd., FREEPOST, Baffins Lane, CHICHESTER, West Sussex PO19 1YP, England

Letters

Sexist games?

I am writing in answer to the comments from Jane Stoneham (*PCW* 9-15 February) about female participation in the computer age I think she is going a little too far in saying that one of the reasons why women do not use computers (in her words that means buy games) is that games are sexist I am not attempting to explain the real reason, but I know that what she said is not true

I don't believe that women are so petty as to be concerned with the sex of games characters Although I spend a lot of my time actually programming, I also play quite a few games and have never really thought of the character's sex

I am sure many people will agree with me when I say that the real reason (why women do not use computers) is probably more the discouragement for young girls who want to do computer studies at school In the words of one of our teachers "And now chemistry and computer studies in the 6th form, which will appeal mostly to the boys"

Vanessa Gregory
2 Bar Lane
Garforth
Leeds LS25 2ED

MoD ban . . . 1

It was with great interest that I read the news item in your last week's issue (*PCW* 16-22 February) concerning the MOD's secrecy order on the software protection system developed by Jim Lamont of JLC Data

Mr Lamont's system seems to be the development that software producers all over the world have been waiting on for around five years now It is gratifying that the seemingly unsolvable problem of tape to tape copying has been cracked by a British engineer This invention could only be good news for the programmers, software houses and, because it would enable the full potential market of a piece of software to be realised, it would allow for a larger margin for competition on price — which can only be good news for the consumer

The current government is fond of telling us that Britain's economic future depends on the inventiveness of the people and on our willingness to become involved in new technology The Home Computer and Software industry is not stronger in any country than it is in Britain Indeed, we seem destined to become the world leader in this field However, a major problem facing our software houses is the amount of illegal duplication of British software that is going on outside Britain JLC Data's technique would seem to be a significant step towards minimising this.

Mr Lamont's discovery is one many people have been working on for a long time With the volume of software being illegally copied today, it was obvious that the rewards for such a system would be considerable The fact that so many, on both sides of the Atlantic, have been working on software protection unsuccessfully for so long must be an indication of just how much work Mr Lamont must have put in to come up with a solution as neat as the one he apparently did

Mr Lamont deserves to benefit from his idea Britain deserves to benefit from his idea I hope it is not too long before the Ministry of Defence realises this

Brian Beattie
Nebulae Software

MoD ban . . . 2

I read with interest your report 'MoD bans software protection' (*PCW* 16-22 February) I was disturbed to find no editorial comment on the MoD's actions Personally, I agree with the sentiments expressed in BBC's Horizon programme *Spies in the wires* (broadcast 29 January and 5 February) namely "given the choice of the police being able to listen in to all of us, or none of us, I would rather have them listen to none of us "

The programme also asked another question "but will we have a choice, assuming a personal unbreakable code is possible, with the technology to use it easily and cheaply available? One question remains, whether the authorities would ever dare to let us have it " The MoD's actions suggest an answer It would seem that the doubts expressed in the programme by some people about DES (data encription standard) may be justified

Another problem would appear to be the reasoning behind the MoD's actions For — with all due respect to JLC Data — the interest in the area of data/software protection is such that (perhaps with the assistance of a less sophisticated patented version from JLC Data) companies or individuals will rediscover the technique Can the MoD expect to control this?

Anyone who has a ulterior motive (especially if they use telephone kiosks) for data encription will probably find a source of encription/protection technique available and not be deterred by its illegality Where does the 'data protection bill stand on the right to privacy — even from the authorities — during transmission (I would consider it a serious omission if no provision is made in the bill for encription-protection)?

D. Tomlinson
(address supplied)

You will find our editorial comment on the MoD's actions in *PCW* 23-29 February.

Like many of our readers, we are concerned at the JLC case and are watching developments closely. It does not seem right to us that the government, or anyone else, should be able to listen in to data transmissions at will.

Queue Longer?

I am prompted to write to you following the progress article about the Sinclair QL computer in your 16-22 February issue

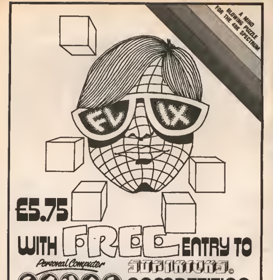
I ordered a QL on Thursday, January 19, the day before orders were offically supposed to be accepted The phone-girl confirmed that, as advertised, delivery would be within 28 days I have now had a letter telling me that Sinclair "expect to be able to deliver" my QL "not later than the end of April" (note the lack of commitment once the advertising medium is not being used)

A friend ordered on the following Monday, and he has been told to expect delivery by the end of May For people ordering now, your finger in the air is as good as mine, no doubt! But will the 28-day figure in the adverts be changed? Perhaps the QL really stands for Queue Longer!

According to your article, the QL could not possibly have been supplied to me within 28 days, and Sinclair must surely have known that when my order was taken, if not when the advert was placed We all know that it is not possible for an order placed now The adverts also continually refer to the MC68008 chip as a 32-bit processor Motorola refer to it as a 16-bit processor with an 8-bit data bus, to show its inferiority to the MC68000, which they describe as a 16-bit processor, and which is almost twice as fast on most instructions

With our letters, we each received a sheet laid out like a receipt, showing the cost of the QL, post and packing, and, in my case, QLUB membership Then Vat was added, and we have noticed that, although the Vat amounts on our sheets were of course different, both amounts and the totals were exactly £1 too much I suggest that your readers should check these figures when they get there letters I would also be very interested in an explanation of how these mistakes were made

Name and address supplied


A MIND BLOWING PUZZLE FOR THE 48K SPECTRUM
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SOFTRICKS©
COMPETITION


VALHALLA



Sea attack

A new game for BBC B by Mark Gidley

The main idea of Sea Atack, for BBC B, is to eat a fish every 10 seconds at least. If you don't, you die of starvation!

You are a shark, but in the same stretch of water there are countless numbers of deadly octopuses. If you get caught by them you are crushed to death!

When the program has loaded, a set of instructions appears in mode 7. Then the computer asks you how many people are playing (it's a kind of competition to see who's the best). Then the program goes into mode 2, showing you what the octopus, fish and yourself, look like.

It then goes into the main game. You have a graphical sea background with weed and sand at the bottom and sea-gulls at the top. When you are killed a tune plays and together with your score it displayed the highest score and the name of the person who scored it.

When every player has had a turn, the computer displays the record holder's name and score. Then you are able to press <SPACE BAR> to play again.

```
10REM***   SEA_ATTACK   **
20REM***   By M Gidley   **
30MODE7:PROCINST HI%=0:V=0:PROCENTER2
40SC%=0:A$="THE BEST"
50MODE2:VDU23;8202;0;0;0;
60PROCCHR
70PROCINTRO
80Z%=0:F%=0:I=0:O=0:T=0
90ENVELOPE1,1,100,5,5,100,0,0,0,5,-5,100,5,127
100PX=5:PY=10
110PROCSCREEN:TIME=0
120J%=INT(RND(1)*21)
130IFJ%<7GOTO120
140GOTO180
150R%=INT(RND(1)*21)
160IFR%<7GOTO150
170T=0
180A=PX:B=PY
190IFINKEY-474ANDPX<14F%=F%+1
200IFINKEY-98ANDPX>1F%=F%-1
210IF ABS(F%)=2 PX=PX+SGN(F%):F%=0
220IFINKEY-105AND PY<27PY=PY+1
230IFINKEY-73ANDPY>7PY=PY-1
240PRINTTAB(A,B);" ":COLOUR7:PRINTTAB(PX,PY);CHR$234
250COLOUR1
260PRINTTAB(I,J%);CHR$233
270PRINTTAB(I-1,J%);" "
280IFR=I AND B=J%PROCSCORE
290IFTIME>1000PROCMUS:S=SC%:MODE7:PROCTL:GOTO50
300VDU127:I=I+1
310IFI=20 I=0:GOTO120
320COLOUR2:COLOUR134:PRINTTAB(0,0);"SCORE:";SC%;
   TAB(10,0);"TIME:";TIME/100
321COLOUR11:COLOUR134:PRINTTAB(6,1);"HI-SCORE"
   'TAB(9);HI%
330COLOUR132
340PROCOCT
350VDU127:O=O+1
360IFT=1 GOTO150
370GOTO180
380DEFPROCSCORE
390PRINTTAB(0,J%);SPC(19)
400SOUND1,1,1,10
410SC%=SC%+10:F%=0:I=0:TIME=0
420J%=INT(RND(1)*21)
430IFJ%<7GOTO420
```



```
440ENDPROC
450DEFPROCTITLE
460CLS:VDU23;8202;0;0;0;
480FORL=0TO1:PRINTTAB(8,L);CHR$141CHR$130
   "S E A  A T T A C K ":NEXT
500ENDPROC
510DEFPROCTL
520FORI=0TO1:PRINTTAB(0,I);CHR$145;STRING$(39,"p")
530VDU23;8202;0;0;0;
540FORI=2TO3:PRINTTAB(0,I);CHR$141CHR$150"
   #########SEA-ATTACK HI_SCORE#############":NEXTI
550FORI=4TO5:PRINTTAB(0,I);CHR$145;STRING$(39,"p")
560FORI=7TO8:PRINTTAB(11,I);CHR$141CHR$147;
   "YOUR SCORE":NEXTI
570FORI=9TO10:PRINTTAB(14,I);CHR$141CHR$133;S:NEXTI
580IFS>HI%HI%=S:PROCENTER
590FORI=11TO23:PRINTTAB(0,I);SPC(39):NEXTI
600FORI=12TO13:PRINTTAB(10,I);CHR$141CHR$147"
   RECORD HOLDER".NEXTI
610FORI=15TO16:PRINTTAB(6,I);CHR$141CHR$133;HI%;
   "....";A$:NEXTI
620FORI=17TO22:PRINTTAB(6,I);SPC(40).NEXTI
630PRINTTAB(0,18);CHR$150;STRING$(39,"p")
640PRINTTAB(7,20);CHR$130"WRITTEN BY M.DIPLEY"
650PRINTTAB(1,23);CHR$136CHR$129"Press SPACE BAR
   to play again"
660REPEATUNTILGET=32
670SC%=0
680V=V+1:IFV=2 PROCEND:CLEAR:RUN
690ENDPROC
700DEFPROCIART
750PROCTITLE
770PRINT'CHR$131;" You,as a shark,have to eat
   the smaller";CHR$131;"fish which are swimming
   around you.";''CHR$129;SPC(15);CHR$136"BUT''"
771PRINT'CHR$131;" You are very hungry so you can
   only   ";CHRR131;"have a 10
   second gap between each fish"
780PRINT'CHR$131;" Around you there are giant
   octopuses ";CHR$131;"just ready
   to kill you at any moment."
790PRINT'CHR$150;STRING$(39,"p")
800PRINTTAB(16,17);CHR$149;"KEYS"
810PRINT'TAB(7);CHR$130;"Z - LEFT     X - RIGHT"
820PRINT'TAB(9);CHR$130;": - UP     / - DOWN"
830PRINTTAB(3,23);CHR$136CHR$134;"Press
   'SPACE BAR' to continue"
840REPEATUNTILGET=32
850ENDPROC
860DEFPROCMUS:RESTORE890:FORN=0TO2:READA:SOUND1,
   -15,A,4:SOUND1,-15,A+20,4:SOUND1,-15,A+10,4:
   SOUND&1001,-15,100,10:NEXTN
870RESTORE890:FORN=0TO2:READA:SOUND1,-15,A,2.5:
   NEXTN:SOUND1,0,6,2:SOUND1,-15,5 0,2
880ENDPROC
890DATA50,60,70,50
900DEFPROCENTER
910*FX15,0
920PRINT''CHR$134"YOU'VE GOT THE")CHR$136;
   "HIGHEST SCORE''"
930INPUT'ENTER YOUR NAME",'A$
940ENDPROC
950DEFPROCSCREEN
960GCOL0,3
970FOR X=0 TO 1280 STEP 20
980MOVEX,0
990PLOT85,X,30
1000PLOT85,X+100,6
1010NEXTX
1020VDU19,0,4,0,0,0
1030COLOUR1
1040GCOL0,5:MOVE0,800:DRAW1280,800
1050DRAW1280,1024:DRAW0,800
1060DRAW0,1024:GCOL0,6:PLOT85,1280,800
1070PLOT85,1280,1024
1080PROCWEED
1090FORR=0TO5:T=RND(18):F=RND(6)
1100COLOUR7:COLOUR134:PRINTTAB(T,F);CHR$234
1110NEXTO
1120COLOUR132
1130ENDPROC
1140DEFPROCWEED
1150FORO=0TO7
1160I=RND(16):S=RND(16)
1180COLOUR2
1190PRINTTAB(1,30);CHR$232
1200PRINTTAB(8,30);CHR$231
1210PRINTTAB(8,29);CHR$232
1220NEXTO:ENDPROC
1240DEFPROCOCT
1250COLOUR10:PRINTTAB(O,A%);"9"
1260PRINTTAB(O-1,A%);" "
1270IFO=19:O=0:T=1
1280IFA=C AND B=R% PROCHIT:TIME=20000
1290ENDPROC
1300DEFPROCHIT
1310SOUND0,-15,100,10
1320ENDPROC
1330DEFPROCINTRO
1340COLOUR1.PRINTTAB(4,3);CHR$233:COLOUR2:
   PRINTTAB(5,3);"....small fish"
1350COLOUR10:PRINTTAB(4,6);"9":COLOUR2:
   PRINTTAB(5,6);"....octopuss"
1360COLOUR7:PRINTTAB(4,9);CHR$254:COLOUR2:
   PRINTTAB(5,9);"....your shark"
1370COLOUR9:PRINTTAB(6,17);"REMEMBER''"
1380COLOUR11:PRINTTAB(4,19);"YOU ONLY HAVE"
1390PRINTTAB(3,20);"10 SECS BETWEEN"
1391PRINTTAB(6,21);"EACH MEAL"
1400COLOUR3:PRINTTAB(2,28);"PRESS SPACEBAR TO";
   'TAB(7);"START"
1410REPEATUNTILGET=32
1420CLS
1430ENDPROC
1440DEFPROCCHR
1450VDU23,254,0,57,253,88,88,253,57,0
1460VDU23,231,158,88,56,146,116,218,88,56
1470VDU23,232,16,144,86,57,218,60,82,144
1480VDU23,233,0,0,0,88,62,88,0,0
1490VDU23,234,0,130,68,56,16,8,0,0
1500ENDPROC
1510DEFPROCENTER2
1520CLS:PROCTITLE
1530PRINTTAB(2,4);CHR$131;"It is a game for 1
   to 4 players in   ";CHR$131;"which you take
   turns to try and beat   ";CHR$131;"your
   friends to become the champion at";''SPC
   (12);CHR$136CHR$130''SEA_ATTACK''
1540INPUTTAB(3,10)"PLEASE ENTER THE NUMBER
   OF PLAYERS",'Z
1550IFZ>4 OR Z<1 GOTO1540
1560ENDPROC
1570DEFPROCEND
1580PROCTITLE
1590FORU=9TO10:PRINTTAB(0,U);CHR$141CHR$129;"THE
   WINNER WITH THE SCORE OF!";HI%:NEXTU
1600FORU=12TO13:PRINTTAB(6,U);CHR$141
   CHR$131;A$:NEXTU
1610PRINTTAB(3,23);CHR$136CHR$134;"PRESS SPACEBAR
   TO PLAY AGAIN"
1620REPEATUNTILGET=32
1630ENDPROC
```


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The home service

***Graham Taylor** talks to Trevor Taylor, producer of Radio 4's* The Chip Shop

Two years ago an experiment was attempted on *Tomorrow's World* — a couple of minutes in the program were taken up with white noise, computer programs broadcast for the ZX81 and Apple

The producer of the program didn't expect much response maybe a couple of letters from buffs with expensive recording equipment What he actually got was a mailbag full of letters from people who had recorded and Run the transmission — and they wanted more

Eighteen months later, they got it. Producer of *Tomorrow's World* then and *The Chip Shop* now is Trevor Taylor, "Nobody had much faith that it would work — maybe a few people able to take the sound directly to a quality recorder — but, in fact we got letters from people who'd got a usable program just by putting a microphone near the speaker; even on the ZX81!"

What they received was a short program that didn't do much other than display *Tomorrow's World* closing credits (with the recipient credited as one of the presenters), but it delighted the hundreds who successfully ran it and proved that the demand existed

The biggest stumbling block was the logistical problem of how to cater for a reasonable selection of micros without filling up airtime with several different kinds of white noise The solution to the problem came from a Dutch radio station

"They were using an early version of *Basicode* (see *PCW* 16-22 February) to transmit programs which could be received by a number of micros We have expanded the machines available and generally developed the system," said Trevor

THE CHIP SHOP BBC Radio4

RADIO 4's COMPUTER PROGRAMME WITH BARRY NORMAN

The arrangement with the Dutch includes not only a royalty agreement, but an undertaking not to make a profit from sales of the *Basicode* tapes — one of the reasons they are being sold so cheaply at £3 95

"The agreement has some slightly odd consequences For example, we can't market the tape through BBC Enterprises since they are geared to make a profit — we have to do it ourselves"

Currently, interest in *Basicode* is high — over 50,000 people have requested order forms and 12,000 of those have actually sent in money Substantial figures, but it is important to realise that on their own they would not be enough to make the radio program viable

"It's not enough just to get the computer owners listening we have to attract a wide general audience of people who listen just out of curiosity"

The Chip Shop seems to be very successful, although the BBC are reluctant to commit themselves to figures, it seems probable, that its Saturday transmission gets an audience of over a million listeners

Part of the reason for this wide success is the choice of front man Barry Norman, who is best known as presenter of *Film 84* "I asked for Barry Norman specifically, because he is a name people know and because he can write a good script to short deadlines Thus far he's been a little more restrained than on his film program, but wait until the next series"

Previous attempts to do computer programs have usually ended up being either too childish or too boring *The Chip Shop* seems to be avoiding these pitfalls and is gaining a reputation for reliable and interesting news, as well as more general coverage of computing topics

"We record the programs on a Friday for broadcast on a Saturday, so we can keep up to date When Apple held its press conference on a Friday evening we had the details in the Saturday show"

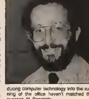
If it's fair to make a comparison between *The Chip Shop* and computer magazines, it could be said that one of the things it lacks is reviews — both of software and, more importantly the machines

Trevor is aware of this problem and is honest about the reasons the program has avoided the subject to date "Quite simply, it's the tie-up with Acorn and the BBC computer — we have problems of credibility "Because the BBC has backed a specific computer, it's difficult for us to review another computer without having people accuse us of bias"

Solving the problem will be a matter both of clarifying the legal position, should a manufacturer take offence at a bad review and, more importantly letting the program develop its own reputation for impartiality so that its views will be trusted. "Reviews are a tricky area, but once the situation is clearer we will definitely be doing them"

Other upcoming developments include a version of *Basicode* for the Spectrum the only major machine previously missing from the range "There were a few extra problems because of the use of keywords, but we have it solved now" The Spectrum version should be available by the time you read this

The Chip Shop's own attempts at intro-



ducing computer technology into the running of the office haven't matched the success of *Basicode*

"We're trying to use *Micromail* running on a Sirius here to send information to the Sirius that Barry has in his home — it's where he writes most of his scripts The problem is that something always goes wrong Just recently, it's been deciding that Barry isn't who he says he is and has stopped recognising his password — I've taken to ringing him in the evenings instead, it's much less hassle"

With the success of the current series there are inevitably plans for another In fact, it is possible the project may be expanded further

"At the moment, *The Chip Shop* is covering both the home micro market and more general computing features We certainly recognise that the two things tend to be distinct" explained Trevor

What happens is far from being finalised and largely depends on listening figures remaining at a high level throughout the current run of *The Chip Shop* One logical move would be to have two programs, one directed at the home users and another covering the market in a more general way for the unconverted

With his tv background, I asked Trevor whether we would be likely to see a version of the program on the television

"Well, let's just say that I agree it would be a logical move — but whatever we did on television I think it would include *Basicode* Radio is by far the best way of transmitting it."

Reading between the lines, it looks as though we can expect a significant increase in the amount of coverage given to micros by radio and tv And the coverage should become more serious and move away from the rather twee approach currently adopted "I think it's fair to say we were surprised by the response," said Trevor. "One of the reasons we have to be a bit cagey about the figures is that no one can believe they are really so high — we're getting them double checked!"

Details of *Basicode* can be obtained from Broadcasting Support Services, PO Box 7, London W3 6XJ Price for the kit is £3.95



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All that glitters . . .

***Simon Lane** looks at the quality of some of the Spectrum software on the market*

Almost as soon as the Spectrum was released (and how long ago that seems), software started to appear for the machine. At first, most of the programs were crudely written, and were nearly all either versions of *Space Invaders* or *Pac-man* rip-offs. With time though, as you would expect, the quality gradually increased.

Programmers started to write entirely in machine code, instead of creating Basic/machine code hybrids or Basic only efforts. Better sound effects and sprite graphics were used to improve the aesthetics of games, and people started to think up original ideas occasionally, instead of always having to copy those 'arcade favourites'.

However, some rubbish still managed to find its way onto the shelves of the computer shops and, unfortunately, here the Spectrum software industry seems to have got itself stuck. Very little has changed for several months, and although the good software is still as good as it has always been, the bad software hasn't got any better.

I'll start by looking at *Bear Bovver* from Artic (48K Spectrum). The cassette insert I had with the review copy of this program was only provisional — consequently, I had a lot of difficulty in trying to work out what the game was supposed to be about. As far as I could gather, the object is to collect a number of batteries onto a lorry at the bottom of the screen, without being caught by creatures of various kinds which pursue you throughout the game. These creatures (whatever they are supposed to be) can be knocked out by dropping the batteries on their heads, or destroyed by setting time bombs, which explode after a few seconds.

When all the batteries have been collected, you move on to another, more difficult level. I failed to see where bears fit into all this, but I assume that this will all be explained on the final version of the cassette insert.

The game is very well written, using sprite graphics and sound to their full advantage. The graphics are very well designed, especially the title screen, and even the characters' legs move as they walk around. I found the game enjoyable to play, but at the same time difficult and frustrating enough to make it addictive.

It also has a lot of nice little touches. For example, if you decide to give up, the message 'Are you a bear or are you a mouse?' appears on the screen. All in all, a very good program.

Next, *Magic Meanies* from CDS Micro Systems. In this game you play the role of 'Meltec', a good wizard of long ago with the strange power of being able to change lead into gold. You have to move around the screen collecting lead, for which you score 100 points per piece, while at the same time trying to avoid being caught by the *Meanies* who are out to get you.

However, you have five crystal balls with which you may attempt to destroy the *Meanies*, and there are some magic apples lying around which you can use to block them off. Should you manage to kill one of them, you will receive 1000 points, and if you manage to eat the cherry that is located somewhere on each screen, you will get a random bonus.

The game is certainly original, and is quite good fun to play. However, I found that the graphics were a bit too small and a little too jumpy, and sometimes I found it quite difficult to see exactly what was going on. A plus point is that the program will run on a 16K machine — something that is quite rare these days — and a Kempston joystick can be used to control the action.

Laser Warp from Mikro-Gen (48K Spectrum) definitely fits into the 'Zap the alien' category of computer software and, if you have not yet tired of such games, you will probably quite enjoy this variation. There are, as you would expect, various different types of alien moving about on the screen, and your task is (you guessed it!) to zap them before they zap you.

But things are made more difficult by the fact that there are two laser cannons at the top left and top right corners of the screen which fire diagonal missiles at you constantly throughout the game. Also, the type of alien changes every time you manage to completely kill one lot off and, apparently, when you get to the tenth level you are confronted with some all powerful being called the 'Master'. Unfortunately, I was unable to find this out for myself, as I was always destroyed by level six, where the missiles get smarter and start to home in on you. Definitely a must for all those still dedicated to the great crusade of wiping out every piece of extra-terrestrial life in existance, but I fear (or rather I hope) that this may well be a dying breed.

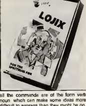
Lojix, published by Virgin Games, is completely different. More of a puzzle than a game, your task is to fit a number of irregularly shaped pieces onto a board without leaving any gaps. Virgin are so convinced that nobody will be able to solve the puzzle that they are putting 50p for each game sold into a special bank account, the contents of which will go to the first person to find the solution and send it in. There is a special section included on the cassette insert to enable you to do this, should you be so lucky as to sort things out.

The program itself would appear to be written in machine-code, since it *Loads* with ""*Code*. However, the speed is so slow that the program must in fact be written in Basic, a fact verified by pressing *Break*, which causes a crash as it would with a protected Basic program. However, it is quite adequate for the purpose, which is all that is important. Anyone who likes solving puzzles should enjoy this program, and might even be able to make some money out of it as well. But, be warned, it is not as easy as it looks.

Space Crystal from Quark Data is an interplanetary trading game for the 48K Spectrum. You have to travel from planet to planet burning up fuel as you do so and, on reaching your destination, decide whether or not to trade with the inhabitants at the rates they offer you. It is a fairly standard trading game, except for a few hazards that can affect you on your travels such as black holes, meteorite storms and space pirates.

The game is written entirely in Basic and, consequently, the animated 3D graphics boasted of on the cassette are not as clever as they might be. However, it is quite entertaining at some points, and is at least a change from the mainstream of 'zap-or-be-zapped' games in that it requires some thought to play.

Diamond Trail from Gilsoft is an adventure game for 48K Spectrum written using *The Quill* adventure game system. Communication with the game is simple in that



all the commands are of the form verb noun, which can make some ideas more difficult to express than they might be on, say, *The Hobbit*.

The scenario of the game is as follows: 'Just before its long awaited premiere, the priceless Sinclive Diamond was stolen from the jewel room of Spectraisi s capital, Microdrivia. You must restore it in as short a time as possible before the public begin to doubt its existance.'

I found the game quite amusing to play, although some of the funniest things I found in the program were not intentional, or at least I don't think they were. For example,

on one occasion I came across a sign saying "Repair work by Pongo Ltd" Having little else better to do I decided that I'd see if there was anyone around besides me, so I typed in 'Hello Pongo', to which the program replied 'We have a nice clean program here So for swearing you can go and start again (without the option of save).'

To give the program its due credit, I must

John Ritman, author of Artic's *Bear Bovver* for the 48K Spectrum. His other programs include *3D Combat Zone* — a micro version of the arcade game *Battle Zone*

say that I did enjoy this adventure very much, although I never actually managed to find the Sinclive Diamond. If you ask me, it hasn't been stolen at all In fact it probably hasn't even been designed yet, but Sinclive has had to think up an excuse to give the hoards of angry customers whose twenty-eight day delivery promises all expired several months ago

Seiddab Attack from Hewson Consultants (48K Spectrum) is a three dimensional arcade-type game in which you are in control of a modern tank or 'Drone' Your tank is to petrol the city streets, destroying any *Seiddabs* that you come across with your steerable surface-to-air missiles

To aid you in your bloody-minded quest you have a short range radar, which indicates the positions of all the *Seiddabs* in the city by steady points of light. Your position is also indicated on this display, should you get lost When you have destroyed at least 10 *Seiddabs* you have to seek out and destroy the Task Force leader The game then continues in the countryside although I didn't ever manage to do well enough to find out for myself

The graphics in this program are superb, with full perspective and smooth, flicker free movement As you move around and turn corners the perspective changes, giving a very impressive realistic effect

The game is very difficult to play, and it requires a lot of concentration if you are to do well However, the effort is well worth it, as the program is great to play, and very addictive My only real complaint is the choice of keys used to control the movement of your ship The cursor keys are used, which means that your fingers are all very close to each other, which tends to lead to confusion

The last three programs in this review are more serious that is to say they are not games *Keydefine* from Scientific Software (48K Spectrum) is a utility enabling you to add new commands to Sinclair Basic It sounds impressive, and it is The program comes with several built-in commands, such as a full Basic program renumber (*Gotos* and *Gosubs* included, as well as *Restore List, Line, Run* and *Llist*) trace, auto line number and hexadecimal conversion, to name but a few

New commands can be saved on to tape, and can consist of either Basic or machine code routines The extra commands are accessed by using the space key as though it were an extra shift key, and can be entered either as direct commands or as statements with line numbers

The final two programs in this review are both published by Sinclair The first of these, *Print Utilities* by Andrew Pennell will Run on either a 16K or 48K machine The program is very easy to use and allows you to vary the size of the characters printed on the screen or printer from the *Print, List Lprint* and *Llist* commands

You have a choice of four different character widths, which allow you to have 16, 21, 32 or 42 characters per line, and there are two heights These extra facilities are accessed by using control characters for example *Chr$ 25* will give you a 42 column screen

I found the extra character sets provided very clear and easy to read even in 42 column mode One use I found for the package was in the accurate labelling of graphs, as the routines extend *At* so that the cursor can be positioned to an accuracy of one pixel

Finally, *Chess Tutor 1* by Braveline Ltd (48K Spectrum) This program will teach you to play chess, if you can't already play or try and help you to improve your game if you can There are five different sections which take you right from first principles to advanced strategy

Each of the sections loads separately from the tape which can be very irritating as it can take quite a long time to locate and load in the section you want However, the advantages of this system are that a large number of examples and exercises can be included, and that a more advanced player can avoid having to relearn a lot of stuff (s)he already knows.

In general the style of teaching is very good, and at the end of each 'lesson you are given the option of being tested on what you have learnt so far

Firm	Program	Cost	Valve (1-10)
Artic Main Street Brandesburton Driffield YO25 8RG	*Bear Bovver*	£5 95	8
CDS 10 Westfield Close Tickhill Doncaster DN11 9LA	*Magic Meanies*	£5 95	8
Gilsoft 30 Hawthorn Road Barry S Glamorgan Wales	*Diamond Trail*	£5 95	7
Hewson 60a St Mary's St Wallingford Oxford	*Seiddab Attack*	£5.95	10
Mikro-Gen 1 Devonshire Cottages London Road Bracknell RG12 2TQ	*Laser Warp*	£5 95	7
Quark Data PO Box 61 Swindon Wiltshire	*Space Crystal*	£5 95	6
Scientific Software 37 Cottesmore Road Hessle North Humberside	*Keydefine*	£4 95	10
Sinclair Stanhope Road Camberley Surrey GU15 3PS	*Print Utilities* *Chess Tutor 1*	£6.95 £5 95	9 9
Virgin 61-63 Portobello Rd London W11 3DD	*Lojix*	£5.95	7


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COMMODORE 64: after finishing HELL GATE Jeff took a couple of days to pop the code into the '64. Whilst this is no Revenge or Hover Bovver, we are offering HELL GATE 64 at the bargain price of £5.00... an interesting diversion to occupy a little time while you wait for Jeff's next '64 epic, which we can now reveal will be called

SHEEP IN SPACE — for which Jeff promises the usual great graphics and sound — and also a totally new control concept... so prepare to feel extremely sheepish in a few month's time.

Until then — to all our followers

A) HAPPY BLASTING/MOWING/SPITTING ETC.

B) DON'T SHOOT THOSE GOATS!!!

Jeff



Minter



AWESOME GAMES SOFTWARE

49 MOUNT PLEASANT, TADLEY, BASINGSTOKE, HANTS.

In register

***Alan McDonald** looks at the different registers found in the Z80 and 6502 processors*

Over the next few weeks I shall be comparing the 6502 and the and the Z80 microprocessors And seeing how they work, eg, how they store and retrieve information These articles are aimed at those of you who can already program on either the 6502 or Z80 and who are thinking about buying another computer which uses a different chip, or for those who are just interested in learning about another processor

We shall start off this week by looking at the different registers found in both the processors The Z80 has a much larger set of registers than the 6502, as shown in the following table

Z80 registers

Main set	
A	F
B	C
D	E
H	L
IX	
IY	
I	R
SP	
PC	

Alternate set	
A'	F'
B'	C'
D'	E'
H'	L'

The A-register is the accumulator, where nearly all of the arithmetic operations are carried out The F-register is the flag register — it holds all six flags The flags in the flag register are

S = Sign flag
Z = Zero flag
H = Half carryflag
P/V = Parity Overflow flag
N = Subtract flag
C = Carryflag

The *B,C,D,E,H,* and *L* registers are all 8 bit ones, ie, they can hold numbers in the range of 8 The good thing about the Z80 is the fact that these registers can be put together to make three 16-bit register pairs, ie *BC, DE* and *HL* The *HL* register pair is special, in that some 16 bit arithmetic can be carried out in it.

The *IX* and *IY* registers are the index registers. They can be used as pointers to point to information in a large table

The Z80 also has an alternate set of registers. However, they cannot be used in the same way as the other registers But, the contents of ordinary registers can be exchanged with the alternate set, which can prove extremely useful.

There are another two 16-bit registers other than the *IX* and *IY* registers (and the three registers pairs) They are the *PC* and the *SP* The *PC* is the program counter — it holds the address of the next instruction to be executed The *SP* is the stack pointer and points to where the stack is held in memory

The *I* register is the Interrupt vector register (see back issues of *PCW*) The *R* register is the recharge or refresh register his purpose is to recharge dynamic memory Over a certain period of time, data starts to drain away — the *R* register looks after this and prevents it from happening.

The 6502 does not have as many registers as the Z80 In fact, it hasn't got many at all The registers which it does have are as follows

6502 registers

A	
X	
Y	
P	
S	
	PC

The A-register (accumulator) acts in the same way as that on the Z80 The *X* and *Y* registers are the index registers On the 6502 the *A, X* and *Y* registers are the only registers where the user can store information The *P* register is the processor status register, ie, the flag register, it contains the following flags

N = Negative (sign)
V = Overflow
B = Break
D = Decimal
I = Interrupt
Z = Zero
C = Carry

The *S* register is the stack pointer Unlike the Z80, it is only an 8 bit register and therefore only capable of holding 255 items on the stack The only 16 bit register in the 6502 is the program counter It is used in exactly the same way as the *PC* on the Z80

Paging

Due to the addressing modes of the 6502, the memory is divided up into logical pages It is important to understand paging, as it can affect the speed of a program Each page can be thought of as a block of 256 bytes

Page 0 = address 0 to 255
Page 1 = address 256 to 511
Page 2 = address 512 to 767 etc

Page 0 is used for speed — there are special addressing modes on the 6502 which allow quick access to this page Page 1 is usually reserved for the stack

I shall now look at the way the 6502 and Z80 store information in memory and in their own registers. The Z80 uses the *LD* instructions (*Load*) to store and retrieve its information Here is an example, *LD A,10* which in English reads 'Load the accumulator with the number 10 Remember the "," (comma) means ' With", therefore when you read an instruction such as *LD A,10* always read it as 'Load A with 10'

There is also a very similar instruction in appearance as the *LD A,10* but very different in operation — it is *LD A, (10)*, which means 'Load the *A*-register with the number held in memory location 10' If memory location 10 held 60, then the *A*-register will now hold 60

Most instructions on the Z80 are symetrical, ie *LD (10), A* which in English reads 'Load the memory address 10 with the contents of the *A* register'

The Z80 also allows you to *Load* the contents of one register into another register It is used as *LD* register, register. This refers to the 8 bit registers From now on we shall refer to reg, which equals an 8 bit register, num = 8 bit number, *reg = 16 bit register and *num = 16 bit number

1) LD (*reg) A
2) LD A, (*reg)
3) LD (HL) num – note this can be LD (HL) reg or LD reg (HL).

Example 1 *Loads* the memory location pointed to by the 16 bit register, with the contents of the *A* register Example 2 *Loads* the *A* register with contents of a memory location pointed to by a 16 bit register eg if the *BC* register pair contained 30000 then whatever is stored at memory address 30000 will be stored into the *A* register Example 3 *Loads* the memory address the *HL* register pair is pointing to with an 8 bit number Here are a couple more instructions which act on 16 bit addresses

1) LD A, (16 bit address)
2) LD (16 bit address) A

Line 1 means Load the *A* register with the contents of the address in memory Thus, if the 16 bit address was 60000, then whatever number is stored at that address will be put into the *A* register The second example

does the opposite and puts whatever is in the *A* register into location 60000

You can also *LD* *reg *num which is the 16 bit equivalent of *LD* reg num The index registers take the form of:

```
LD reg (IX+displacement)  LD (IX+displacement) reg
LD reg (IY+displacement)  LD (IY+displacement) reg
```

The word displacement refers to an 8 bit number in the range of −128 to +127 Imagine you had a large table of numbers 1-7 by using the index registers you can refer to any part of the table

```
LD IX, table start
LD A, (IX+16) interrefers to the 16th byte from the start of the table
```

You can also load information into the stack pointer and change the stacks address in memory The following instructions are allowed

```
LD SP  16 bit address
LD SP  HL
LD SP  IX
LD SP  IY
LD SP  (contents of a 16 bit address)
```

There are still more Load instructions but I shall ignore them They are *LDI, LDIR, LDD* and *LDDR*

The 6502 uses three instructions to handle information, *Load*, *Store* and *Transfer* Whenever I use Hex, I shall put an "&" sign in front of the number, eg, *&FF* The reason for using Hex is to help us tell the difference from page 0 addresses ie, page 0 addresses only uses two digits whereas any other page uses four digits — 8 bits and 16 bits Let's look at the simplest Loading instruction first

```
LDA # &00
LDX # &00
LDY # &00
```

The "#" means "with the value of" What it does is to put the number 0 into whatever register is specified Note only the *A X* and *Y* registers can be used Now take a look at the following instructions

```
LDA &00
LDX &00
LDY &00
```

These examples mean Load the appropriate register with the contents of a specified memory location (these instructions used page 0, but they could have used *LDA &0000* (ie a 16 bit address) If the memory address *&00* contained 60 then *LDS &0?*, would load 60 into the *A* register

The following instructions do exactly the same as the previous ones, except that they refer to any 16 bit address

```
LDA &0000
LDX &0000
LDY &0000
```

The *X* and *Y* registers in the 6502 are used as index registers and can be used as follows

```
Page 0   LDA &00 X
         LDX &00 Y
         LDY &00,X
16 bit addressing
         LDA &0000,X
         LDA &0000 Y
         LDX &0000 Y
         LDY &0000 X
```

These examples use the *X* and *Y* registers as a displacement Imagine the *X* register contained 10 — then this instruction *LDA &FF00,X* would load the *A* register with the number found in location *&FF10* ie *&FF00+10*

The *Store* instruction does the opposite of the *Load* instruction here is a list of the store instructions

```
Page 0   STA &00
         STA &00 X
         STX &00
         STX &00 Y
         STY &00
         STY &00 X
16 bit addresses
         STA &0000
         STA &0000,X
         STA &0000 Y
         STX &0000
         STY &0000
```

Remember page 0 is used for speed

There is only one remaining set of instructions to look at, the *Transfer* commands The *Transfer* command on the 6502 is the same as (*LD* register, register) on the Z80 Here is the list of transfer commands available

```
TAY transfers the contents of A into Y
TAX A into X
TYA Y into A
TXA X into A
```

To transfer *Y* into *X* or *Y* you will have to

```
TYA followed by TAX     Y into X
TXA followed by TAY     X into Y
```

TURN YOUR PROGRAMME UPSIDE DOWN

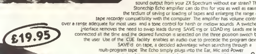
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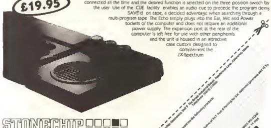


Programmable Joystick Interface This also enables any Spectrum software to be used with a joystick, irrespective of which keyboard keys have been chosen for function

Programming is easy using only a single switch Switch one way to program and another way to play. No tapes to load or links to worry about — all programming is achieved by hardware Used with Atari-compatible joysticks Simply plugs into rear expansion port of ZX-Spectrum No other connections to make, no additional power supply required



Echo Amplifier How would you like to listen to the sound output from your ZX Spectrum without ear strain? The Stonechip Echo amplifier can do this for you as well as easing the tedium of saving or loading of tapes and enlarging the range of tape recorder compatibility with the computer The amplifier has volume control over a range adequate for most uses and a tone control for harsh or mellow sounds A switched interface removes the need to swap leads during SAVE ing or LOAD ing Leads are left connected all the time and the desired function is selected on the three position switch by the user Use of the CUE facility enables an audio cue to precede the program being SAVE d on tape, a decided advantage when searching through a multi-program tape The Echo simply plugs into the Ear, Mic and Power sockets of the computer and does not require an additional power supply The expansion port at the rear of the computer is left free for use with other peripherals and the unit is housed in an attractive case custom designed to complement the ZX Spectrum



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A question of degree

***Chris Cox** presents a program that shows a regular polygon rotating through 360 degrees*

Three-D Rotator is, as may be guessed from its name, a program which graphically represents in three dimensions a regular polygon rotating through 360 degrees.

The computer, 16 or 48K, requires three inputs — the number of sides, speed and size. The number of sides and size are both self-explanatory and all that speed means is the number of degrees through which the polygon rotates between graphical constructions.

When the listing has been entered, to save it, just go to line 1000 and press any key — the program will now autorun upon loading.

The tilt of the polygon can be altered by changing the 2.5s in lines 290 and 300. The lower the number, the greater the tilt and vice-versa. But, if the tilt is increased, the size of the polygon must not be too great.

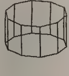
The program is in three main sections. The first just sets all the variables and deals with the inputs. The second is the main section that calculates the points to be drawn, and stores them into arrays *x,y,a* and *b*. The final section completes the program by drawing out the shape.

The mathematics behind the program is very simple using only basic trigonometry and should be easy to convert for other computers.

```
100 REM [redacted]
110 REM [redacted]
120 REM
130 REM [redacted]
140 BORDER 1: PAPER 0: INK 7: CLS
150 INPUT "No. of sides ? ",z: LET zz=2*PI/z
160 INPUT "Speed (DEGREES 1-359) ? ",d: LET de=2*PI/360*d
170 IF d<1 OR d>359 THEN GO TO 160
180 INPUT "SIZE (1-90) ? ";r
190 IF r<1 OR r>90 THEN GO TO 180
200 REM [redacted]
210 FOR e=0 TO 2*PI STEP de
220 LET cx=128: LET yb=88-r/2: LET yt=88+r/2: LET dn=0
230 DIM x(z): DIM y(z): DIM a(z): DIM b(z)
240 REM [redacted]
250 FOR n=zz+e TO 2*PI+zz+e-0.0001 STEP zz
260 LET dn=dn+1
270 LET x(dn)=COS n*r+cx
280 LET a(dn)=x(dn)
290 LET y(dn)=yb-SIN n*r/2.5
300 LET b(dn)=yt-SIN n*r/2.5
310 NEXT n
320 CLS
330 REM [redacted]
340 FOR s=1 TO z-1
350 PRINT AT 0,0;"[redacted]=",z,TAB 13,"[redacted]=",d,TAB 25,"[redacted]=",r
360 LET dx=x(s+1)-x(s)
370 LET dy=y(s+1)-y(s)
380 PLOT x(s),y(s): DRAW 0,r: PLOT x(s),y(s)
390 DRAW dx,dy
400 LET dx=a(s+1)-a(s)
410 LET dy=b(s+1)-b(s)
420 PLOT a(s),b(s): DRAW dx,dy
430 NEXT s
440 LET dx=x(1)-x(z)
450 LET dy=y(1)-y(z)
460 PLOT x(z),y(z): DRAW dx,dy
470 PLOT x(z),y(z): DRAW 0,r
480 LET dx=a(1)-a(z)
490 LET dy=b(1)-b(z)
500 PLOT a(z),b(z): DRAW dx,dy
510 NEXT e
520 GO TO 150
1000 SAVE "3d rotator" LINE 100
```

[redacted]=5 [redacted]=10 [redacted]=50

[redacted]=10 [redacted]=10 [redacted]=50




WHO ARE
the
LORDS
of
MIDNIGHT

Gaining access

Chris Woods demonstrates how to access machine code from Basic using the Usr command

There are several ways of accessing machine code from Basic. By far the easiest way is to use the *Exec* command. The problem with this is that it does not allow one to pass parameters.

Incidentally, when saving a machine code program using *Csavem*, the last parameter is the *Exec* address. So, when yuou load the program and use *Exec* (no address) the program will execute at the address specified by the last number in the *Csavem* command.

Another way to access machine code is to use the *Usr* command. Contrary to popular belief, it is possible to use all 10 commands (*Usr0-9*). When defining the *Usr* functions use a single digit number, eg, *Def Usr0 Def Usr5*. When calling them, insert a 0 before all numbers except 0, eg, *Usr0*, *Usr05*.

The *Usr* call should be followed by a number in brackets. This is called a parameter and must be an integer in the range 0-32767. Once executed, it is possible for the machine code routine to obtain this number. This is done by executing a *Jsr 35623* command after which the number will be in the D-accumulator.

A far more user friendly way would be to add extra commands to Basic which execute your machine code routines.

One way to od this would be to use the method outlined by Bernice Hennessy in Vol 2 No 47 of this magazine. There are, however, two problems with this method. Firstly, it uses excessive amounts of memory and secondly, for each command gained one is lost.

Fortunately there is another way. When each statement is executed, the Basic interpreter jumps to location 377. This normally contains an *Rts* instruction, but a *Jmp* instruction can be inserted. When it jumps here the A-accumulator holds the token code of the statement unless it is unrecognised, in which case it holds the Ascii code of the first character. All token codes are above 127.

The routine that follows tests to see if the code is above 127 and, if so, lets Basic carry on. If it is not, it compares the word at the text pointer with the words in a predefined table. If it matches one of them, a machine code routine is executed corresponding to the matched word.

After the machine code routine has finished, the text pointer is incremented to the start of the next word. Then a token code is inserted into the A-accumulator, so that a syntax error does not occur. The code must represent a fairly inactive statement.

I decided to choose *Troff* (*169*). The only problem with this is that it cancels any previously set *Tron* statement. An alternative would be Rem (*130*), but this causes any further statements on the same line to be ignored.

The accompanying table consists of six bytes for each new command. They are as follows:

Byte(s)	Meaning
1	ASCII code of the first character in the statement.
2	Length of the statement in characters.
3-4	The sum of the ASCII codes of all the characters in the statement.
5-6	The execution address of the user routine

The table must end with a '*'.

The program has three example new routines — *Invert* (inverts the hi-res screen currently in use), *Lpon* (sends all characters that are sent to the screen to the line printer as well), *Lpoff* (cancels *Lpon*).

The table starts at line 570. Each user routine must end with an *Rts* instruction. Once the program has been assembled it must be executed once to initiate it. For those without assemblers, the second column of hexadecimal numbers should be poked in.

```
7530              40        ORG
00A6              50 @TXTPTR EQU 166
7530 8E753C       60 @START LDX #@TEST   SET POINTER
7533 BF017A       70        STX 378      TO HANDLER
7536 867E         80        LDA #126     CHANGE RTS
7538 B70179       90        STA 377      INSTRUCTION TO JMP
753B 39          100        RTS          RETURN TO BASIC
753C 8180        110 @TEST CMPA #128     TEST FOR NORMAL TOKEN
753E 2501        120        BLO @TESTB   BRA IF IT IS
7540 39          130        RTS          RETURN TO BASIC
7541 B775B3      140 @TESTB STA @CHAR    SAVE CHAR
7544 9EA6        150        LDX @TXTPTR  SET UP
7546 108E759F    160        LDY #@TABLE  POINTERS
754A B675B3      170 @TEST1 LDA @CHAR    COMPARE
754D A1A4        180        CMPA ,Y      STATEMENT
754F 2624        190        BNE @NEXT    TO
7551 CE0000      200        LDU #0       DATA
7554 A621        210        LDA 1,Y      IN
7556 4A          220 @TEST2 DECA         TABLE
7557 E680        230        LDB ,X+      ADD
7559 33C5        240        LEAU B,U     IF
755B 8100        250        CMPA #0      DIFFERENT
755D 26F7        260        BNE @TEST2   THEN
755F 10A322      270        CMPU 2,Y     JUMP TO
7562 2611        280        BNE @NEXT    @NEXT
7564 3430        290        PSHS X,Y     SAVE POINTERS
7566 ADB804      300        JSR [4,Y]    JUMP INDIRECT TO USER SUBROUTINE
7569 3530        310        PULS X,Y     RESTORE POINTERS
756B E621        320        LDB 1,Y      GET TXTPTR
756D 5A          330        DECB         TO START
756E 3A          340        ABX          OF NEXT
756F 9FA6        350        STX @TXTPTR  STATEMENT
7571 86A9        360        LDA #169     GET TROFF STATEMENT
7573 39          370        RTS          AND RETURN TO BASIC
7574 3126        380 @NEXT LEAY 6,Y      GO ONTO
7576 A6A4        390        LDA ,Y       NEXT STATEMENT
7578 812A        400        CMPA #42     IN TABLE AND
757A 26CE        410        BNE @TEST1   TEST FOR THE SAME
757C B675B3      420        LDA @CHAR    IF END THEN
757F 39          430        RTS          RETURN TO BASIC
7580 8E0E00      440 @INVERT LDX #3584   USER SUBROUTINES
7583 6380        450 @INV1 COM ,X+
7585 8C2A00      460        CMPX #10752
7588 26F9        470        BNE @INV1
758A 39          480        RTS
758B 8E851A      490 @LPON LDX #34074
758E BF0168      500        STX 360
7591 867E        510        LDA #126
7593 B70167      520        STA 359
7596 39          530        RTS
7597 8639        540 @LPOFF LDA #57
7599 B70167      550        STA 359
759C 39          560        RTS
759D 4906        570 @TABLE FCB 73,6
759F 01D87580    580        FDB 472,@INVERT
75A3 4C04        590        FCB 76,4
75A5 0139758B    600        FDB 313,@LPON
75A9 4C05        610        FCB 76,5
75AB 01777597    620        FDB 375,@LPOFF
75AF 2A          630        FCC "*"
75B0             640 @CHAR RMB 1
75B1             650        END @START
```

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ection of software.

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Game, set and match

***Colin and David Pryka** present a tennis program for two playars*



This tennis program is a two player game with optional bat size. It will run on a BBC B microcomputer

By cutting out the mode7 command in line 100 it will also run on an Acorn Electron



Variables

SCO1	BALLY
SCO2	BALLX
BATPOS1	DIRX
BATPOS2	
DIRY	

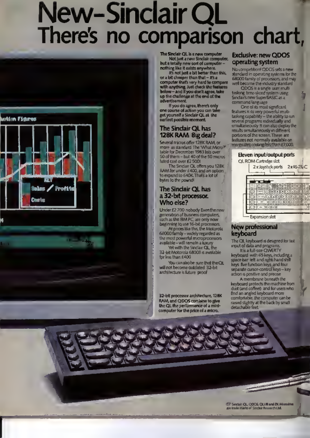
```
L.
   10REM **************
   20REM *** TENNIS ***
   30REM ***   (C)  ***
   40REM ***  COLIN ***
   50REM ***  PRYKE ***
   60REM ***  1984  ***
   70REM **************
   80A$=""
   90*TV255,2
  100MODE7
  110VDU23;8202;0;0;0;
  120SCO1=0
  130SCO2=0
  140BATPOS1=512
  150BATPOS2=512
  160BALLX=500
  170BALLY=500
  180DIRX=1:REM -1=LEFT 1=RIGHT
  190DIRY=-1:REM -1=UP 1=DOWN
  200CLS
  210PRINTCHR$129;CHR$141;TAB(15)"TENNIS"
  220PRINTCHR$129;CHR$141;TAB(15)"TENNIS"
  230PRINT
  240PRINTCHR$130;CHR$136;"(C) COLIN PRYKE"
  250PRINT
  260PRINT
  270PRINT"THIS IS A VERSION OF THE CLASSICAL"
  280PRINT"GAME OF TENNIS. TWO PLAYERS MOVE BATS"
  290PRINT"ON EITHER SIDE OF THE BOARD, WHILE A"
  300PRINT"BALL BOUNCES AROUND THE SCREEN. THE"
  310PRINT"PLAYERS HAVE TO KEEP IT BOUNCING, IF"
  320PRINT"ONE PLAYER MISSES IT THE OTHER PERSON"
  330PRINT"GETS A POINT."
  340PRINT
  350PRINT
  360PRINTCHR$135;"BAT SIZE, SMALL, LARGE (S/L)"
  370REPEAT
  380A$=INKEY$(0)
  390UNTIL A$="S" OR A$="L"
  400IF A$="L" THEN SIZE=200
  410IF A$="S" THEN SIZE=100
  420PRINT
  430PRINT
  440PRINT"LEFT PLAYER:                :RIGHT PLAYER"
  450PRINT
  460PRINT"A---UP                            UP-----:"
  470PRINT"Z---DOWN                          DOWN---/"
  480PRINT
  490PRINTCHR$134;"          HIT SPACE TO START";
  500REPEAT
  510A$=INKEY$(0)
  520UNTIL A$=" "
  530 MODE2
  540 COLOUR130:CLS
  550PRINTTAB(5,2);SCO1;TAB(15,2);SCO2
  560MOVE0,100
  570DRAW1280,100
  580MOVE0,900
  590DRAW1280,900
  600REPEAT
  610*FX15
  620IF DIRX=-1 BALLX=BALLX-32
  630IF DIRX=1 BALLX=BALLX+32
  640IF DIRY=1 BALLY=BALLY-32
  650IF DIRY=-1 BALLY=BALLY+32
  660IF BALLY<120 THEN DIRY=-1
  670IF BALLY>880 THEN DIRY=1
  680IF BALLX<120 AND BALLY<BATPOS1 AND BALLY>BATPOS1-SIZE THEN DIRX=1
  690IF BALLX>1160 AND BALLY<BATPOS2 AND BALLY>BATPOS2-SIZE THEN DIRX=-1
  700MOVEBALLX,BALLY
  710DRAWBALLX+4,BALLY
  720GCOL0,7
  730IF BALLX<100 THEN SCO2=SCO2+1:PRINTTAB(5,2);SCO1;TAB(15,2);SCO2:BALLX=500:BALLY=500:DIRX=-1
```

```
740IF BALLX)1200 THEN SCO1=SCO1+1:PRINTTAB(5,2);SCO1;TAB(15,2);SCO2:BALLX=500:BALLY=500:DIRX=1
750IF SCO1=15 OR SCO2=15 THENMODE7:PROCEND
760IF INKEY(-66) THEN BATPOS1=BATPOS1+32
770IF INKEY(-98) THEN BATPOS1=BATPOS1-32
780IF INKEY(-73) THEN BATPOS2=BATPOS2+32
790IF INKEY(-105) THEN BATPOS2=BATPOS2-32
800IF BATPOS1)900 THEN BATPOS1=BATPOS1-32
810IF BATPOS1-SIZE(85 THEN BATPOS1=BATPOS1+32
820IF BATPOS2)900 THEN BATPOS2=BATPOS2-32
830IF BATPOS2-SIZE(85 THEN BATPOS2=BATPOS2+32
840MOVE 100,BATPON1
850DRAW 100,BATPOS1-SIZE
860MOVE 1100,BATPOS2
870DRAW 1100,BATPOS2-SIZE
880GCOL0,2
890MOVE 100,BATPOSI
900DRAW 100,BATPOSI-SIZE
910MOVE 1100,BATPOS2
920DRAW 1100,BATPOS2-SIZE
930MOVEBALLX,BALLY
940DRAWBALLX+4,BALLY
950GCOL0,7
960UNTIL FALSE
970 DEFPROCEND
980CLS
990 PRINT
1000 PRINT
1010 IF SCO1=15 THEN A$="ONE"
1020IF SCO2=15 THEN A$="TWO"
1030PRINTCHR$141;CHR$129;"PLAYER ";A$;" HAS WON''''''''''''''''''''''"
1040PRINTCHR$141;CHR$129;"PLAYER ";DAT$;" HAS WON''''''''''''''''''''''"
1050 PRINT
1060 PRINT
1070PRINT
1080PRINT"Another game ?";
1090REPEAT
1100A$=INKEY$(0)
1110UNTIL A$="Y" OR A$="N"
1120IF A$="N" THEN STOP ELSE RUN
1130ENDPROC
```


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Several micros offer 128K RAM, or more as standard. The 'What Micro?' table for December 1983 lists over 50 of them – but 40 of the 50 micros listed cost over £2 500!
The Sinclair QL offers you 128K RAM for under £400, and an option to expand to 640K. That's a lot of bytes to the pound!
The Sinclair QL has a 32-bit processor. Who else?
Under £2 700 nobody. Even the new generation of business computers, such as the IBM PC, are only now beginning to use 16-bit processors.
At prices like this, the Motorola 68000 family – widely regarded as the most powerful microprocessors available – will remain a luxury.
Yet with the Sinclair QL, the 32-bit Motorola 68008 is available for less than £400.
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Sinclair QL, QDOS, QLUB and ZX Microdrive are trade marks of Sinclair Research Ltd.
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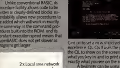
£399

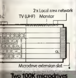
…, because there's no comparison !

Advanced new friendly language – Sinclair SuperBASIC

The new Sinclair SuperBASIC combines the familiarity of BASIC with a number of major developments which allow the QL's full power to be exploited.

Unlike conventional BASIC, its procedure facility allows code to be written in clearly-defined blocks; extendability allows new procedures to be added which will work in exactly the same way as the command procedures built into the ROM; and its constant execution speed means that SuperBASIC does not get slower as programs get larger.





Two 100K microdrives built in

The Microdrives for the Sinclair QL are identical in principle to the popular and proven ZX Microdrives, but give increased capacity (at least 100K bytes each) and a faster data transfer rate. Typical access speed is 3.5 seconds, and loading is at up to 15K bytes per second. The Sinclair QL has two built-in Microdrives. If required, a further six units can be connected.

Four blank cartridges are supplied with the machine.

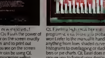


® Quill, Easel, Archive and Abacus are trade marks of Psion Ltd.

Included – superb professional software

The suite of four programs is written by Psion specially for the QL and incorporates many major developments. All programs use full colour, and data is transportable from one to another. (For example, figures can be transferred from spreadsheet to graphics for an instant visual presentation.)

Word-processing



[illegible] to set a new standard of excellence. QL Quill uses the power of the QL to show on the screen exactly what you key in, and to print out exactly what you see on the screen.

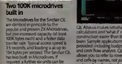
A beginner can be using QL Quill for word processing within minutes.

QL Quill brings you all the facilities of a very advanced word-processing package.

Business graphics

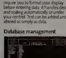
QL Easel is a high resolution [illegible] program so easy to use you probably won't refer to the manual! It handles anything from lines, shaded curves or histograms to overlapping or stacked bars or pie charts. QL Easel does not require you to format your display before entering data: it handles design and scaling automatically or under your control. Text can be added and altered as simply as data.

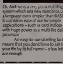
Spreadsheet



QL Abacus makes simultaneous calculations and 'what if' model construction easier than they've ever been. Sample applications are provided, including budget planning and cash flow analysis. QL Abacus allows you to refer to rows, columns and cells by names, not just letters and numbers. Function keys can be assigned to change a variable and carry out a complete 'what if' calculation with a single key-stroke.

Database management





QL Archive is a very powerful filing system which sets new standards, using a language even simpler than BASIC. It combines ease of use for simple applications – such as card indices – with huge power as a multi-file data processor.

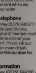
An easy-to-use labelling facility means that you don't have to ask for your file by its full name – a few letters are enough.

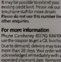
New – the Sinclair QLUB

The QLUB is the QL Users Bureau. Membership is open to all QL owners. For an annual subscription of £35 QLUB members receive one free update to each of the four programs supplied with the QL, and six bi-monthly newsletters. Sinclair has also made exclusive arrangements for QLUB members to obtain software assistance on QL Quill, Abacus, Archive or Easel by writing to Psion.

The Sinclair QL challenge

If you're seriously considering any other computer, post the coupon for a blow-by-blow comparison. We'll take a *published* comparison chart for the machine you're considering (not one we've created ourselves) and give you the Sinclair QL figures, detail by detail.





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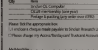
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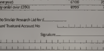
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Designers colours

Lee Tanner presents a sprite editor program to design hi-res and multi-colour sprites

This program is called *Spriter* and is for the Commodore 64. It is a sprite editor which allows you to design hi-res and multi-colour sprites, using any of the 15 colours of the Commodore 64.

When the program is run, you will be presented with a large grid in which you design your sprite. As you are designing it, a normal size sprite will take shape in a box to the right of the large grid.

When you have completed the design, just press *Return* and the sprite data in the form of three columns of numbers will be displayed. After pressing *Return* again, you will be presented with a list of options. Pressing *F1* will allow you to design another sprite. *F3* will end the program and *F5* will print out the sprite data, if you have a printer connected.

The program contains instructions for entering hi-res or multi-colour sprite mode, as well as instructions for which keys to use in the design mode. Here is how the program works.

Program notes

10-26	Title page
27-30	Set Sprite mode
32-35	Enter colours for sprite
40-50	Instructions for keys
90-110	Set up sprite and screen
120-290	Main loop for design
300-355	Prints sprite data
360-410	Options for use
500-550	Sprite data to Printer

```
10 POKE53281,15 PRINT"                                        "
11 PRINT"                                        "
12 PRINT"                                        "
13 PRINT"                                        "
14 PRINT"                                        "
20 PRINT"
21 PRINT"           BY       "
22 PRINT"                    "
23 PRINT"         LEE TANNER "
24 PRINT"                    "
25 PRINT"          22/8/83.  "
26 PRINT"                    "
27 PRINT" PRESS '0' FOR HI-RESOLUTION"
28 PRINT" PRESS '1' FOR MULTI COLOUR." C1=16 C2=16 C3=16
29 GETG$ IFG$="0"THENMO=0 GOTO32
30 MO=VAL(G$) IFMO<>1THEN29
32 PRINT" ENTER COLOUR 1 (0 - 15) "; INPUTC1 IFC1<0ORC1>15THEN32
33 IFMO=0THEN40
34 PRINT" ENTER COLOUR 2 (0 - 15) "; INPUTC2 IFC2<0ORC2>15THEN34
35 PRINT" ENTER COLOUR 3 (0 - 15) "; INPUTC3 IFC3<0ORC3>15THEN35
40 PRINT" USE KEYS "
41 PRINT"Y.........UP"
42 PRINT"B.......DOWN"
43 PRINT"G.......LEFT"
44 PRINT"H......RIGHT"
45 PRINT"1...COLOUR 1"
46 IFMO=1THENPRINT"2...COLOUR 23...COLOUR 3"
47 PRINT"SPACE.RUBOUT"
48 PRINT"RETURN...END"
49 PRINT" PRESS ANY KEY TO START "
50 POKE198,0 WAIT198,1 POKE198,0
90 V=53248 POKEV+21,1 POKEV,252 POKEV+1,116 POKE2040 200
91 POKEV+39,C1 POKEV+37,C2 POKEV+38,C3
92 POKEV+28,MO
100 POKE53281,1 PRINT""
101 SP=1024+41 CC=55337-SP POKE650,255
102 X=0 Y=0 Z=SP+X+Y*40 P=79 C=12 SD=200*64 FORI=0TO63 POKESD+I,0 NEXTI
103 FORI=1TO21 PRINT"                        " NEXT
104 PRINT""
105 PRINT"                  1",
106 PRINT"                  "
110 POKEZ,214 POKECC+Z,C IFMO=1THENPOKEZ+1,214 POKECC+Z+1,C
120 GETG$ IFG$=""THEN120
130 IFG$="Y"ANDY>0THENY=Y-1
140 IFG$="B"ANDY<20THENY=Y+1
150 IFG$="G"ANDX>0THENX=X-(MO+1)
160 IFG$="H"ANDX<23+(MO=1)THENX=X+(MO+1)
170 IFG$=" "ORG$>"0"ANDG$<"4"THEN200
175 IFG$=CHR$(13)THEN300
180 POKEZ,P POKECC+Z,C IFMO=1THENPOKEZ+1,P POKECC+Z+1,C
185 Z=SP+X+Y*40 P=PEEK(Z) C=PEEK(CC+Z)
190 GOTO110
200 IFG$=" "THENC=12 P=79
210 IFG$="1"THENC=C1 P=160
```

```
215 IFMO=0THEN240
220 IFG$="2"THENC=C2 P=160
230 IFG$="3"THENC=C3 P=160
240 BY=Y*3+INT(X/8):IFMO=1THEN260
245 BI=2↑(7-(XAND7))
250 IFG$=" "THENPOKESD+BY,PEEK(SD+BY)AND(NOTBI) GOTO290
255 POKESD+BY,PEEK(SD+BY)ORBI GOTO290
260 B1=2↑(7-(XAND7)) B2=2↑(7-((X+1)AND7))
270 IFG$=" "THENPOKESD+BY,PEEK(SD+BY)AND(NOTB1) POKESD+BY,PEEK(SD+BY)AND(NOTB2)
275 IFG$="1"THENPOKESD+BY,PEEK(SD+BY)ORB1 POKESD+BY,PEEK(SD+BY)AND(NOTB2)
280 IFG$="2"THENPOKESD+BY PEEK(SD+BY)AND(NOTB1) POKESD+BY,PEEK(SD+BY)ORB2
285 IFG$="3"THENPOKESD+BY,PEEK(SD+BY)ORB1 POKESD+BY,PEEK(SD+BY)ORB2
290 GOTO110
300 PRINT"SPRITE DATA"
310 FORI=0TO20 FORJ=0TO2
320 PRINTSPC(J*10),PEEK(SD+I*3+J)""
330 NEXTJ PRINT NEXTI
340 PRINT"PRESS RETURN WHEN READY"
350 GETG$ IFG$<>CHR$(13)THEN350
355 POKEV+21,0
360 PRINT"F1 TO CREATE ANOTHER SPRITE" PRINT"F3 TO END"
365 PRINT"F5 FOR PRINTOUT"
370 GETG$ IFG$=""THEN370
380 IFG$=""THENPOKE53281,6 PRINT"" END
390 IFG$=""THENGOSUB500 GOTO360
400 IFG$<>""THEN370
410 PRINT"" GOTO27
500 PRINT"PRINTING":OPEN 1,4
510 PRINT#1,CHR$(18)CHR$(16)"97SPRITE DATA"CHR$(146)CHR$(13)
520 FORI=0TO20 FORJ=0TO2
530 PRINT#1,PEEK(SD+I*3)CHR$(16)"10"PEEK(SD+I*3+1)CHR$(16)"20"PEEK(SD+I*3+2)
540 NEXTI CLOSE 1
550 RETURN
```

Open Forum is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed. We will pay the _Program of the Week_ double our new fee of £6 for each program published.

Demo

on Vic 20

This program was written on the unexpanded machine. It demonstrates some of the Vic capabilities, including sound, colour and user definable graphics. The program begins by pokeing a giant version of the word Vic to the screen, then the Commodore emblem is reproduced using user definable graphics. This is followed by three different sound affects. Another tune is played between the three stages. After the program is run then the *Run/Stop* and *Restore* keys must be pressed before it is run again.

Program notes

60 Sets the screen colour and variables
80 Sets two more variables E-position, S-colour
90—190 Pokes the curved part of the letter V on to the screen
220—240 Pokes the straight part of the letter, it also pokes the letter I on to the screen.
280—460 Pokes the letter C on to the screen. All three letters have been poked on in a giant form.
470—490 This line prints a message
510—550 This section pokes the Commodore emblem produced by user definable grapahics into the memory
560—590 This routine makes the word Vic cross the screen
630—680 These lines make the Commodore emblem drop as if it were a bomb of some kind
680—690 This routine prints another message
700—800 This section makes the line sound effect, that of a laser beam.
810—860 This section produces the second sound, this time it is an Ufo shooting
870—930 The third sound of the red alert is produced
960—1080 This subroutine plays a little tune when entered twice in the program.

```
10 REM VIC DEMO
20 REM BY EUROF DAVIES
30 REM (C) 1982
40 PRINT"♥"
50 POKE36079,109 W=1 P=7770 R=38490 D=0 F=10
60 GOSUB 220
70 IFW=-1 THEN GOSUB220
80 E=7990 S=38710
90 POKEE+22,95 POKES+22,7
100 POKEE+23,160 POKES+23,7 POKEE+24,223 POKES+24,7
110 POKEE+24,223 POKES+24,7
120 POKEE+45,95 POKES+45,7
130 POKEE+46,160 POKES+46,7
140 POKEE+47,160 POKES+47,7
150 POKEE+68,95 POKES+68,7 POKEE+69,105 POKES+69,7
160 POKEE+48,105 POKES+48,7
170 POKEE+25,230 POKES+25,7
180 POKEE+26,160 POKES+26,7
190 POKEE+27,105 POKES+27,7
200 W=-1 D=10 F=0 P=P+4 R=R+4 GOSUB220
210 GOTO280
220 FORT=DTOF STEPW
230 POKEP+(T*22),160 POKER+(T*22),7 POKEP+1+(T*22),160 POKER+1+(T*22),7
240 NEXT
250 IFW=-1 THEN  W=1 D=0 F=13 P=P+4 R=R+4 GOSUB 220
260 RETURN
270 IFW=-1 THEN  W=1 D=0 F=12 P=P+4 R=R+4 GOSUB 220
280 P=7936 R=38656
290 POKEP,160 POKER,7 POKEP+1,160 POKER+1,7
300 POKEP-21,160 POKER-21,7 POKEP-22,160 POKER-22,7
310 FORT=1TO5
320 POKEP-21-(T*22),160 POKER-21-(T*22),7 POKEP-22-(T*22),160 POKER-22-(T*22),7
330 POKEP+(T*22),160 POKER+(T*22),7 POKEP+1+(T*22),160 POKER+1+(T*22),7 NEXTT
340 J=P-22+1+(T*22) K=R-22+1+(T*22) V=P+1-(T*22) B=R+1-(T*22)
350 POKEJ+1,223 POKEK+1,7 POKEV+1,105 POKEB+1,7
360 POKEV-23,233 POKEB-23,7 POKEV-22,160 POKEB-22,7 POKEV-21,160 POKEB-21,7
370 POKEJ,160 POKEK,7 POKEJ+21,95 POKEK+21,7 POKEJ+22,160 POKEK+22,7
380 POKEJ+23,160 POKEK+23,7
390 FORY=1TO2
400 POKEV-21+Y,160 POKEB-21+Y,7 POKEJ+23+Y,160 POKEK+23+Y,7 POKE7787,223 POKE38
507,7
410 POKEV+2,95 POKEB+2,7 POKEV+2+Y,160 POKEB+2+Y,7
420 NEXT Y
430 POKEV+25,95 POKEB+25,7 POKEV+26,160 POKEB+26,7
440 POKEJ+2,233 POKEK+2,7 POKEJ+3,160 POKEK+3,7
450 POKEJ+4,160 POKEK+4,7 POKE8073,105 POKE38793,7
460 POKEJ-19,232 POKEK-19,7 POKEJ-18,160 POKEK-18,7
470 PRINT"▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮──────────────"
```

```
480 PRINT"XXXXXXXXXXXXXXXXXXXXXXXWELCOME TO VIC LAND"
490 PRINT"XXXXXXXXXXXXXXXXXXXXXXX====================" GOSUB 960
500 POKE52,28 POKE56,26 POKE51,0 CLR
510 FORI=0TO511
520 POKE7168+I,PEEK(32768+I) NEXT
530 FORI=0TO7 READJ POKE7168+I,J NEXT
540 DATA 56,78,140,128,140,70,56,0
550 POKE36869,255 POKE36861,8
560 PRINT"J" POKE36879,110 Q=7681 W=38401
570 FORD=3TO15
580 FORT=1TO17
590 POKEQ-1+T,32 POKEQ+T,22 POKEW+T,1 POKEQ+1+T,9 POKEW+1+T,1 POKEQ+2+T,0 POKEW
+2+T,1
600 FORI=1TO100 NEXT
610 IFT<>DTHENGOTO640
620 FORY=1TO20
630 POKEQ+2+T+((Y-1)*22),32 POKEQ+2+T+(Y*22),0 POKEW+2+T+(Y*22),1 FORS=1TO20 NE
XTS
640 NEXT
650 POKEQ+2+T+((Y-1)*22),32 PRINT"J"
660 NEXT D
670 D=38864 F=8144
680 POKEF,22 POKED,0 POKEF+1,9 POKED+1,0 POKEF+2,0 POKED+2,0
690 PRINT"XXXXXXXXXXXXXXXXXXXXXXX20 RULES O.K."
700 FORI=1TO5000 NEXT PRINT"J"
710 PRINT"XXHERE ARE SOME SOUND" PRINT" EFFECTS"
720 FORG=1TO1000 NEXT GOSUB 960
730 PRINT"J" PRINT"XXXXLASER BEAM"
740 POKE36878,15
750 FORL=1TO30 FORM=250 TO240 STEP-1
760 POKE36876,M
770 NEXTM
780 FORM=240TO250
790 POKE36876,M POKE36876,0
800 NEXT L POKE36878,0
810 FORT=1TO300 NEXT PRINT"J" PRINT"XXXUFO SHOOTING"
820 POKE36878,15 FORL=1TO15
830 FORM=200TO220+L*2
840 POKE36876,M
850 NEXTM NEXT L
860 POKE36878,0 POKE36876,0
870 PRINT"J" PRINT"XXXRED ALERT"
880 POKE36878,15
890 FORL=1TO10 FORM=180TO235STEP2
900 POKE36876,M FORN=1TO10 NEXTN NEXTM
910 POKE36876,0
920 FORM=1TO100 NEXTM NEXTL POKE36878,0
930 PRINT"J"
940 PRINT"XXXXXXXXBYE..BYE..." PRINT"XXXSEE YOU SOON...."
950 END
960 RESTOPE
970 POKE36878,15
980 FORL=0TO20
990 READU,Z
1000 IFU<163 ORU>201THEN1050
1010 POKE36875,U POKE36876,U
1020 FORT=0TO30*Z NEXTT
1030 POKE36875,0 POKE36876,0
1040 FORT=0TO10*Z NEXTT
1050 NEYTL
1060 DATA 187,4,187,4,201,2,201,4,201,2,195,2,195,2,183,2,163,2,175,6,163,1,175
,1
1070 DATA183,2,195,2,195,2,201,2,195,2,183,2,163,3,175,1,183,2,183,2,175,2,175,
2,163,6
1080 RETURN
```

Demo
by T Davies

M/C aid

on Spectrum

The purpose of this program is to help all us would-be machine code dabblers with the some of the more tedious tasks. It will accept both decimal and hexidecimal inputs for programming. Provision has been made for printers and dissemblers.

1 Load machine code from tape into selected area.
2 Save machine code to tape.
3 Program entry — both in decimal & hexidecimal.
4 Relocate program.
5 Dump to printer.
6 Load dissembler.

The program has been written with a view to user expansion. The selection routine has been located in the 8000 region allowing plenty of room for further routines, maybe even for the Micro-drive. No real idiot-proofing has been used as I feel this should not be needed.

The Dissembler portion has been left simply as a loader so the user can utilise more than one type (I use two-one to the screen and one to my printer).

Points to note are the hex to decimal routines in lines 115 & 116. Also note the use of *Poke* 23658,8 this sets the capital shift lock to on. The rest of the program is quite easy to follow and requires no real explanation.

I have also included some machine code routines for your amusement/use. The first is a simple sound effect (NB. The use of call 949 here, ie, the beep routine). The second longer program, is for left and right character shift & colour shift. A good tip when adding M/C routines to your programs is to utilise the printer buffer locations 23296 to 23552 bearing in mind, of course, if the printer is used in the program these will be lost. I find that it's quite a good place for sound effects on invader type games.

```
   1 REM ***********************
   2 REM *                     *
   3 REM *    M/C ROUTINES     *
   4 REM *         BY          *
   5 REM *   A.JAMES 1983 ©    *
   6 REM *                     *
   7 REM ***********************
   9 GO TO 8000
  10 CLS : PRINT AT 0,9;"M/C LOA
DER": INPUT "START ADDRESS...? "
,A: CLEAR (A-1): LOAD ""CODE : S
TOP
  11 GO TO 8000
  20 CLS : PRINT AT 0,9;"SAVE RO
UTINE": INPUT "NAME..? ";X$: IF
LEN X$>10 THEN GO TO 20
  21 INPUT "ADDRESS..? ",A
  22 INPUT "LENGTH..? ",S
  29 SAVE X$CODE A,S
  30 PRINT '' "SAVED..": PAUSE 2
00: GO TO 8000
 100 REM M/C PROGRAMER
 101 CLS : PRINT AT 0,8;"M/C PRO
GRAMER"
 102 LET K=2: INPUT "START ADRES
S..",A
 103 INPUT "LENGTH ",L
 111 INPUT "INPUT IN DECIMAL..?(
Y) ",Y$: IF Y$="Y" THEN GO TO 12
5
 112 IF Y$<>"Y" THEN INPUT "IN H
EX THEN..? ",N$: IF N$<>"Y" THEN
 GO TO 111
 113 FOR X=A TO (A+L)
 114 INPUT "HEX CODE..(##)",: L
INE H$: IF LEN H$<>2 THEN GO TO
114
 115 IF (CODE H$(1)>CODE "F") OR
 (CODE H$(2)>CODE "F") THEN GO T
O 114
 116 DEF FN A(H$)=CODE H$-48-7*(
H$>"9"): DEF FN B(H$)=16*FN A(H$
(1))+FN A(H$(2))
 117 LET Z=FN B(H$)
 118 PRINT X,Z," (",H$,")": POKE
 X,Z: LET K=K+1: NEXT X
 119 GO TO 130
 125 FOR X=A TO (A+L)
 126 INPUT "CODE..? ",C: IF C=50
0 THEN LET X=A+L: GO TO 129
 128 PRINT X,: POKE X,C: PRINT "
",: PRINT C
 129 LET K=K+1: NEXT X
 130 PRINT : PRINT "LENGTH= ",K
 140 PAUSE 900: GO TO 8000
 200 PAUSE 100: CLS : PRINT AT 0
,9;"RELOCATE"
 201 PRINT '': INPUT "OLD ADDRES
S...? ",A: PRINT "OLD.....",A
 202 INPUT "NEW ADDRESS.....? ",
E: PRINT "NEW..... ",E
 203 INPUT "LENGTH..........? ",
L: PRINT "LENGTH.. ",L
 204 PAUSE 100: LET M=E-A
 205 FOR X=A TO A+L: LET Z=PEEK
X: POKE X+M,Z: PRINT X+M,Z: NEXT
 X
 206 PRINT ''"FINISHED RELOCATION
"
 207 PAUSE 100: GO TO 8000
 300 CLS : PRINT AT 0,9;"M/C DUM
P ROUTINE"
 301 PRINT '': INPUT "NAME...? ";
N$: LPRINT "NAME....",N$: INPUT
"START ADDRESS...? ",A: LPRINT
"START...",A
 302 INPUT "END ADDRESS.....? ",
E: LPRINT "END..... ",E
 303 IF A>E THEN GO TO 302
 304 LPRINT : FOR X=A TO E STEP
5: LPRINT X," ",
 305 FOR Y=X TO X+4: LPRINT PEEK
 Y",",: NEXT Y: LPRINT
 306 NEXT X
 307 PAUSE 2: GO TO 8000
 400 PAUSE 10: CLS : PRINT AT 0,
9;"DISSEMBLE"
 401 PRINT AT 5,0;"INSERT DISSEM
BLE TAPE INTO TAPE MACHINE, THEN
 PRESS <<ENTER>>": PAUSE 0
 402 PRINT AT 9,9; FLASH 1;"LOAD
ING": FLASH 0: LOAD ""
7999 STOP
8000 POKE 23658,8: CLS : PRINT A
T 3,9;"M/C ROUTINES"
8001 PRINT
8002 PRINT "  1....TO LOAD M/C"
8003 PRINT "  2....TO SAVE M/C"
8004 PRINT "  3....TO PROGRAM M/
C"
8005 PRINT "  4....TO RELOCATE M
/C"
8006 PRINT "  5....TO DUMP M/C"
8007 PRINT "  6....TO DISSEMBLE
M/C"
8008 PRINT "  0....TO END"
8009 PRINT '"  HIT NUMBER OF RO
UTINE REQUIRED"
8010 LET Z$=INKEY$
8011 IF Z$="1" THEN GO TO 10
8012 IF Z$="2" THEN GO TO 20
8013 IF Z$="3" THEN GO TO 100
8014 IF Z$="4" THEN GO TO 200
8015 IF Z$="5" THEN GO TO 300
8016 IF Z$="6" THEN GO TO 400
8019 IF Z$="0" THEN CLS : RANDOM
IZE USR 4757
8020 GO TO 8010
9999 SAVE "ROUTINES" LINE 1
```

```
NAME....        EFFECT 1
START...        32000
END.....        32029

32000 6,3,197,33,15,
32005 0,17,40,0,229,
32010 205,181,3,225,17,
32015 4,0,167,237,90,
32020 125,254,255,32,237,
32025 193,16,230,201,0,
```

```
NAME....        COLOUR LEFT
START...        32000
END.....        32014

32000 17,33,1,237,176,
32005 33,14,58,17,119,
32010 25,13,200,24,201,
```

```
NAME....
```

```
NAME....        COLOUR RIGHT
START...        32050
END.....        32064
```

```
32050 17,33,1,237,184,
32055 33,14,56,17,119,
32060 25,13,200,24,201,

NAME....            CHR. LEFT
START...            32100
END.....            32124

32100 6,192,17,0,64,
32105 213,225,38,197,1,
32110 31,0,26,237,176,
32115 43,119,0,35,35,
32120 19,193,16,240,201,

NAME....            CHR. RIGHT
START...            32150
END.....            32174

32150 6,192,17,0,64,
32155 213,225,35,197,1,
32160 31,0,26,237,176,
32165 43,119,0,35,35,
32170 19,123,16,240,201,

32000 LD    B,20          6
                          20  ?
32002 PUSH  BC            197 OR
32003 LD    HL,768        33  !
                          0   ?
                          3   ?
32006 LD    DE,1          17  ?
                          1   ?
                          0   ?
32009 PUSH  HL            229 RESTORE
32010 CALL  949           205 STEP
                          181 ASN
                          3   ?
32013 POP   HL            225 LLIST
32014 LD    DE,16         17  ?
                          16  ?
                          0   ?
32017 AND   A             167 PI
32018 SBC   HL,DE         237 GO SUB
                          82  R
32020 JR    NZ,32006      32
                          240 LIST
32022 POP   BC            193 STR$
32023 DJNZ  32002         16  ?
                          233 DIM
32025 RET                 201 <>
32026 NOP                 0   ?
32027 NOP                 0   ?
32028 NOP                 0   ?

32000 LD    B,10          6
                          10  ?
32002 PUSH  BC            197 OR
32003 LD    HL,15         33  !
                          15  ?
                          0   ?
32006 LD    DE,20         17  ?
                          20  ?
                          0   ?
32009 PUSH  HL            229 RESTORE
32010 CALL  949           205 STEP
                          181 ASN
                          3   ?
32013 POP   HL            225 LLIST
32014 LD    DE,16         17  ?
                          16  ?
                          0   ?
32017 AND   A             167 PI
32018 LD    (23149),DE    237 GO SUB
                          90  Z
                          125 }
                          254 RETURN
32022 RST   56            255 COPY
32023 JR    NZ,32020      32
                          237 GO SUB
32025 POP   BC            193 STR$
32026 DJNZ  32002         16  ?
                          230 NEW
32028 RET                 201 <>
32029 NOP                 0   ?
```

M/C Aid
by Andrew James

Characters

on BBC

Defining characters is sometimes difficult because finding exactly the right character for a certain program is sometimes difficult

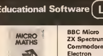
This short program generates random characters, not by using *Rnd* but by using a 'GCOL 3,2', 'VDU 5 then printing a character moving the cursor back a space then printing another character on top This will produce a different character The programe runs on any BBC since it uses numbers needed to define it.

Some of the characters may inspire programmers to create new programs The program runs on any *Beeb* since it uses MODE 5 graphics

```
10 MODE 5
20 VDU 23,255,255,255,255,255,255,255,255,255
30 VDU 19,3,2;0;
40 A$=STRING$(10,CHR$(255))
50 B$=STRING$(8,CHR$(255))+"          "+CHR$(255)+"
60 GCOL 3,0
70 FOR L1%=33 TO 130
80 FOR L2%=33 TO 130
90 COLOUR 3
100 PRINT "Character :
110 COLOUR 3
120 PRINT TAB(0,3)A$'B$;A$
130 VDU 5,25,4,200;1020;L1%,8,L2%,4
140 FOR Y%=1 TO 8
150 I%=0
160 COLOUR 1
170 FOR X%=1 TO 8
180 C%=POINT(X%*80/?,1022-Y%*4)
190 IF C%<>0 PRINT TAB(X%,Y%+3)CHR$(255)
200 IF C%<>0 I%=I%+2^(8-X%)
210 NEXT
220 COLOUR 3
230 PRINT TAB(11,Y%+3);I%
240 PRINT TAB(15,Y%+3)"&";~I%
250 NEXT
260 PRINT '''"Press a key"
270 A=GET
280 CLS
290 NEXT
300 NEXT
```

Line 50 has 8 spaces then 10 spaces

Characters
by Mark Colson



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Open Forum

Loader

on Ace

This short program will enable Ace owners to enter machine code in hex or decimal form. It is so short I have not thought it necessary to include notes.

```
MACHINE CODE
   LOADER

 Simon S. Cross. 1983.

: INPUT
 QUERY LINE
;

: D
 DECIMAL
;

: H
 16 BASE C!
;

DEFINER CODE
 CLS ." No. bytes to be entered ? "
 INPUT CR CR
 ." Hexadecimal or decimal ? (h/d) "
 INPUT CR 0
 DO
  INPUT C,
 LOOP
 DECIMAL 253 C, 233 C,
 CR CR
DOES>
 CALL
;
```

Loader
by Simon Cross

Microradio

GW6JJN

On-air

For the last few weeks *Microradio* has been looking at the software available for various computers.

This week is the turn of the Oric 16/48 and the BBC/Electron machines.

A release from Vomek Software has been sent to me giving details of more amateur radio and short-wave listener programmes as follows:

Radio Teletype (RTTY) for the Oric 1 (both 16 and 48K) by T J Tugwell, priced at £7.50.

Also *Morse Tutor* and *Locator*, both for the Oric 1 (again 16 and 48K) and both priced at £4.50. The *Locator* program will calculate the distance and bearing of other stations and also give contest scoring if needed.

The same three programs are also available from Vomek for the BBC and Electron computers: *RTTY* (£7.00), *Morse Tutor* (£5.00) and *Locator* (£4.50).

Details of all six from Vomek Software, 11 The Dell, Stevenage, Herts SG1 1PH. I hope to be able to tell you more about the Vomek software when I have seen it in use.

I have received a letter from Derwyn GW4SAB who describes his experiences sending programs and data over the air on 144 MHz (2 metres). According to Derwyn, on air networking is very succesful and without the drawbacks of conventional networking — like astronomic telephone bills!

Derwyn and another station, Bill GW4THK, report total success in transferring Spectrum data at the first attempt. Incoming data is down-loaded directly into the computer from the transceiver's external speaker socket. Transmission is achieved by modifying the microphones by inserting a 2.5mm jack socket into the microphone line between the microphone element and the transceiver. The push-to-talk button is held down and the Spectrum given the *Save* command. Likewise with receiving using *Load*.

The distance involved is about six miles which is good in hilly terrain using only 3 watts. Derwyn also mentions more sophisticated ways of sending and receiving which I will save until a later column when I shall concentrate on hints, tips and mods.

Martin Stone of Reading has written in with news of a radio communications interface for the Commodore 64. The device functions as a terminal for morse, RTTY, ASCII, slow-scan television and a telephone modem. The unit is called Com-In 64, costs £99 and details can be had from Computer World, Hilvertsweg 99, 1214JB, Hilversum, Netherlands. ■

Ray Berry GW6 JJN

This [illegible] is designed for radio and microcomputer enthusiasts alike. If you have any queries that you want answered, hints and tips to share or topics that you would like to see covered write to: Ray Berry, *Microradio*, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.


Programmers
If Telephone Number Royalties from other Software Companies impress you — I think you'd better READ ON . . .
There is tremendous competition in the software market at present with literally hundreds of titles to choose from
Some companies are overloaded with games, which usually results in low sales for each title, often well below 10 000 units Naturally the programmer is left out in the cold with the company comfortably in the warm
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All this, of course, can result in fame for the programmer with possible T V and newspaper interviews to further promote the games Do you remember show three of the Magic Micro Mission (I T V Central) where we talked about our first three releases?
So what's the snag? Well if you can call it one, here it is We are offering contracts for games for the ZX Spectrum and Commodore 64 of exceptional quality that are not only graphically good and totally original, but ones that will not lose their appeal after a few days Multi screen arcade games and adventures stand a strong chance of selection
So if you've completed a game or are near completion, drop us a line with a description of the game, or send a copy by recorded delivery (for your own security) to The Software Manager, Titan Programs Ltd., The Computer Palace, 46 Market Place, Chippenham, Wiltshire SN15 3HU
TITAN
PROGRAMS



Tony Bridge's Adventure Corner



Added graphics

Last week I said we'd look at added graphics: graphics can go a long way towards evoking an atmosphere for the player. They can range from the simple line drawings of programs like Phipps' *Greedy Gulch*, much of which consists of a map or plan of the town, through the same author's *Knight's Quest*, which consists of labouriously-drawn line pictures, to the intricate engravings of *The Hobbit*.

The Hobbit, as nobody can deny, will go down in adventuring history as one of the classics (I can't wait to see the new Melbourne House program, *Sherlock*!), and one the reasons for its popularity is the sense the player gets of actually being in the midst of the action.

There are several reasons for this. I think that the pretty pictures are not an important part of the program (even though, unlike other adventures, there is some authenticity in the pictures, as they are taken from Tolkien's own illustrations for the book) that is not to say that I do not enjoy them! On the contrary, the graphic content of *The Hobbit*, though not a particularly new idea in adventures, certainly gave a kick up the behind to the home market. But it must be the animation that transforms *The Hobbit* from a pretty game with a few tough puzzles (because there are really only a few) into a glimpse into a magical world.

Although Thorin gets a bit tiresome, and Gandalf never seems to sit still for more than a couple of moves, all the to'ing and fro'ing of the various characters, as well as that poor old Waug who can't seem to hold up his end of a fight, creates an environment in which the player can lose himself. Sometimes it seems as if the adventure in *The Hobbit* is merely a sideshow, and just out of sight of the player is a whole world going about its business.

Scott Adams includes some cartoon-like drawings (executed with the aid of his own Graphic Package), with a good *Inventory* sequence, which shows the "player" shaking out his bag, with all the objects lying around his feet. Locations, too, show those objects left lying around, which disappear as they are *Taken*.

The ultimate Graphic Adventures, of course, are the Arcade hybrids — in the end, whether graphics add or detract from the flavour of realism must remain a very subjective matter. But it seems obvious that we have only just seen the beginning of an ever-increasing bid for realism in adventures, and it will be us, the players, who benefit in the end.

Now, on to the Hobbit Hall of Fame. In the past couple of weeks so many people have written to me that I must spread the HHOF over two weeks!

Chris Law of Mill Hill: Chris would like to know how to get more than 60 per cent — try collecting all the keys, opening the side door in the mountains and bashing a few goblins as you move about, Chris.

J Kirkwood, on his CBM 64, with hi-scores of 92.5 per cent, 97.5 per cent and "possibly 105 per cent, which was displayed as 5 per cent". This is a well-documented flaw of the Commodore version. I've also noticed that *The Hobbit* seems to return rather higher scores in this version. Mr Kirkwood also draws my attention to the fact that the Spectrum Hobbit-bug (the *En Du* and *Ex Do* anomalies) does not exist for the Commodore user, being interpreted quite normally.

Trevor Kenyon with 70 per cent — the Golden Key, Trevor, serves no purpose apart from a few points. The riddle of Gollum is, like all good riddles, obvious when you know the answer! Look in Julius Caesar — Brutus was an honourable one!

Mrs C A Pedder, on her BBC, and on Friday 13th! Mrs Pedder brings my attention to the problem of the BBC locking up if a *Saved* game is read back in to the computer — this is something that several BBC-ers have mentioned. It seems that while Melbourne House has learnt English (witness the final congratulatory message which has changed subtlely since the old Spectrum days!), it seems to be penalising other computer-users in other ways. Another very tiresome bug she mentions is that the *Restored* game starts again with the score at zero — this is certainly not the case with the Spectrum version, and, as far as I know, not in the Commodore version either (I haven't yet heard from an Oric owner on this subject). It might be worth asking Melbourne House, Mrs Pedder, if you have a faulty tape (I'm glad to hear that you enjoyed it, though!)

Andrew Dyson, with a score of 87.5 per cent — his letter includes a list of high scores which should please some of our readers (it just makes my fingers smart sympathetically!)

Manic Miner 2,609,755
Chuckie Egg 614,000
Lunar Jetman 278,000
Atic Atac 13.47 mins
Smuggler's Cove 2!!!!!
Pyramid 111,765

That's all I have time for this week — more HHOF next week, and some comments about *Valhalla*.

Are you stuck in an adventure? Are you faced by a problem that seems insurmountable? *Adventure Helpline* may be the answer.

Adventure Helpline is quite simply designed to put adventurers in touch with one another. Where you may be stumped by a baffling puzzle, a fellow adventurer may be able to help. By the same token, you may be able to help other people with their problems.

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This series of articles is designed for novice and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So, if you have an Adventure you want reviewed, or if you are stuck in an Adventure and cannot progress any further, write to Tony Bridge, Adventure Corner, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

Peek & Poke



GREENHOUSE HEATER

Mr Y Granel of Farm Mill Close, Banbury, Oxfordshire, writes

Q I have a BBC computer, and I am looking for some means whereby I can control electric sockets, as I wish to turn on the heater in my greenhouse at various times when I am out. I would also like to turn on some lights in the house. Is there any way of doing this using my computer?

A Basically what you wish to do is very simple. Use the BBC internal clock to send output signals. An interface that I knew of which will allow you to do this without much trouble is marketed by S J Research and they can be found at 108 Mill Road, Cambridge CB1 2DD.

SPECTRUM SOUND

Ian Redfern of Goodison Boulevard, Doncaster, South Yorkshire, writes

Q Could you please give me any information you have about improving the sound on my ZX Spectrum. I don't want to make an expensive purchase, but I am disappointed by the *Beep* command and the way it works.

A Whilst it is possible to get some effective sound from the Spectrum it always involves using machine code and even then, there are two big problems, firstly it only has one channel, harmonies and chords are virtually impossible, secondly, sound stops all other processing so you can't, for example, have continuous music whilst a game is playing. (Although *Manic Miner* appears to achieve this, in fact the processor is jumping back and fourth between sound making and other tasks — consequently the sound seems "jittery".

The only real solution is to buy an add-on containing a special sound chip which is solely devoted to the purpose of making sounds — ie, the processor doesn't need to be tied up making sounds. There are several of them available, but so far as I know all have the same basic sound chip as their basis, the AY-3-8910. This gives you three channel sound — each channel can have an individually adjusted pitch and volume and you have a choice of wave forms and attack/decay levels (how "immediate" is the sound and how long does it take to pass away). By using one sound to control another, allsorts of synthesiser-like effects can be obtained.

The sound units all plug in to the printer port at the back of the Spectrum and are controlled by a series of *Out* commands — they are quite simple to use within Basic programs, although there are very few commercially available programs that utilise them. The sound add-ons all cost around £20 and there are several different companies making them, including Fuller, who do a stylish sound box that is also a Beep amplifier and a joystick port. Micro Power do a plainer but cheaper one — at one time Micro Power also had some programs that worked with it to good effect.

MEMORY CHIPS

Charles Game of Firtree Road, Banstead, Surrey, writes

Q Please could you explain why if two 2114 RAM computer memory chips are needed to give 1K of memory why one 2114 RAM computer chip does not give ½K of memory. Or am I mistaken in this?

A You are correct. The reason for this odd state of affairs is that the 2114 has only four data lines. So it can only output four bits at a time. As you know, most home computers are eight-bit and need memory that can be accessed eight bits at a time. From this you can see why two 2114 chips give you 1K. Each chip stores 4096 bits in four 1024-bit groupings.

If you were dealing with a four-bit *Cpu* then a single 2114 would give you 1K of four bit memory. On the other hand, if you had a 16-bit *Cpu* then four 2114 chips would be needed to give a single 1K of memory space.

GARBAGE COLLECTION

Jim Allen of Lonsdale Avenue, East Ham, London E6, writes

Q I have a Vic 20 which I bought in November. I already knew something about Basic having borrowed a friend's old ZX81. On the 81 I wrote a smallish program, where from time to time I came out of a Loop, into a sub routine. Having mastered the necessary translation from Sinclair Basic to Commodore Basic, I translated the program and it Ran without problems.

Recently I have added 3K to my Vic so that I might extend this program. However, having extended it, I find that I am sometimes getting crashes, especially if I use the program a lot when RUNning it. It is still under 6K and when I tried the extra on the ZX81 there was no problem. I have checked my translation, and have used it in other programs, with no problems. Is there any advice you can offer? It is a very frustrating situation.

A You are dealing with the subject of garbage collection. In most computers, but not the ZXs, every time you come out of a loop and then go back several stray bytes are added to the *Gosub* stack. At some point or other the *Gosub* stack will fill up, leaving no room to complete your loop.

In the ZX computers the value is put into the Systems Variables and this is how to get around the problem on other computers. When you come out of a loop, set a new variable to the current value of the loop. So if you had an initial loop of *For A= 1 TO 25* and you came out of the loop on, say, 12 then you need a line *Let B= 12* so that when you return to the loop you in effect overwrite the existing one with a line *For A= B TO 25*.

ISSUE 3 UPGRADES

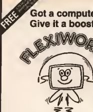
Andrew Lee of Hill Tor Road Huddersfield, writes

Q I have a 16K issue 3 Spectrum, and I would like to upgrade to a 48K Spectrum. But all the upgrades I have seen are for Issue 2 Spectrums. Could you please tell me the company, and the price. I also need to know if they have an expansion port so that I can plug more peripherals into my Spectrum.

A There are, as far as I know, three companies that do upgrades for the Issue 3 16K Spectrum. They are East London Robotics, Fox, and Fullers. However a certain amount of care needs to be taken, as next to the video modulator are three straps, that need changing depending on the manufacturer of the *Ram* chips already on board. The best bet would be to take a look at the computer PCB first, and quote the manufacturer of the chips. Addresses are: East London Robotics, No 11 Gate, Royal Docks, London E16, Fox Electronics, 141 Abbey Road, Basingstoke, Hants, Fuller Micro-systems, 71 Dale Street, Liverpool 2.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Ian Beardsmore and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke, PCW,* 12-13 Little Newport Street, London WC2R 3LD


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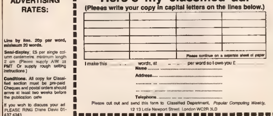
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ORIC I — 48K Colour Printer plotter Quickshot joystick £20 worth of software plus books Leads included etc £800 Sell for £340 ono Tel West Malling 842679 as new

VALHALLA. Brand new and unused I already have a copy Sell for £10 or near offer Tel (0449) 818581 after 5 15pm.

48K ORIC I. £74 of are £188 Tel Buxton 60877

PETS 2001, 3032, 8032, Computers with VDU's also 2023 printer All Commodore compatible Offers invited. Call Colin Harpenden 05827 69038

CURRAH SPEECH and Sound for Spectrum £17 ono ETX game £2.60 Machine code for The Absolute Beginner Book and a ZX Microdrive Order Form Highest offer secures. Phone Tilbury 77328

Wanted

48K SPECTRUM. Swap for Atari VCS + 7 games including Phoenix + joysticks and Paddles. Norwich 25765

MK 4 COMPUTER. Offers! Tel Kevin 0279 36074

SWAP ADVENTURELAND and Volcano Castle or cassette (0734) 23653 Reading

SPECTRUM 48K with leads and manuals, good condition Will pay between £50-£70 Tel 01-778 0186 after 6pm.

EXCHANGE 40ch CB and aerials + metal detector Both hardly used. For issue 2 or 3 Spectrum Must be in good condition. Tel 061 787 5760 (evenings)

SPECTRUM SOFTWARE to swap. Pyramid Alchemist, Ant Attack, M Coder English Literature French O Level Revision, Frenzy Mr Wimpy Out, Gobble a Ghost, Black rose and Sentinel. Tel Bristol (0272) 566599

SPECTRUM SOFTWARE swap wanted Any one of 1994 Apocalypse Roman Empire Oracles Cave Atic Atac Alchemist or Dungeon Master for Go To Jail (Originals only) Phone Jeff B'ham 779 3006

SWAP (CBM 64) Hobbit, Matrix, Hungry Horace or Laser Zone for (CBM 64) Manic Miner Bragger Hunchback or Revenge of MC Write to Stephen Birds Overhide, Biggin Buxton Derbyshire SK17 0DQ

EDITOR/ASSEMBLER package for TI99/4A Also P-code card and Pascal discs, programming aids software TI writer module Write or Phone Walt Davidson PO Box 21, Swansea, SA1 1ED Tel (0792) 201111 evenings.

SWAP 40 CHANNEL CB radio for 16K Spectrum CB includes aerial, swr meter and power pack, worth £75 Woking 73883

SWAP LYNX 48K, 4 games very good condition for Spectrum (Sinclair) 48K with printer + are Tel Eastbourne 51884

SEIKOSHA GP100A printer or similar! Will pay up to £130 Tel 0268 80529

SPECTRUM SOFTWARE to swap or sell Many titles include Deathchase Hunchback Chess, Games Designer and many more If interested phone 0606 410018 after 6pm

BBC MODEL B, 1.2 O.S with or without extras Rainham Gillingham Kent 33326

COMPUTER SWAP

Computer Swap entries are limited to 30 words Either fill in the accompanying form and send to Computer Swap *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD or telephone 01-437 4343

All software offered through computer swap must be in original condition and for private sale only

Warning: It is illegal to advertise pirated software

COMPUTER SWAP

Please write your copy in capital letters on the lines below

Name ....

Address ....

....

Telephone ....

ADVENTURE HELPLINE

Micro: *Spectrum 48K*
Adventure: *Valhalla*
Problem. *I cannot find the first quest object (ie OFNIR). I can only find FELSTRONG*
Name: *R. Jones*
Address: *18 Buttermere Drive, Allestree, Derby DE3 2SN*

Micro *Vic 20*
Adventure *Voodoo Castle*
Problem *Can I open the grating up the chimney. Also What does your funny code mean.*
Name: *A. Heath*
Address: *32 Lower Dolcliffe Road Mexborough, S. Yorks. Nr Doncaster S64 9PA*

Micro: *Commodore 64*
Adventure *The Hobbo*
Problem. *How do you talk to Gollum (or get ring) without being strangled*
Name: *S. Johnston*
Address: *69 Wheatier Riggs Road, Salterbeck, Workington, Cumbria CA14 5HS*

Micro. *Sinclair ZX81*
Adventure *Inca Curse*
Problem: *I get on to the Temple steps at the beginning but I cannot get through the latch door*
Name *Philip Whitehead*
Address: *79 Millfield Road, Scarcroft Road, York YO2 1NH, Yorkshire*

Micro: *Spectrum 48K*
Adventure *Inca Curse (Adventure B) by Artic*
Problem: *How can I put out the fire on the stairs in the fire room. Also what object do I need to go down the porthole in the sand dungeon and to pass through the secret panel in the east wall of the panelled room*
Name: *Ivor Clarke*
Address: *59 Balsham Road, Linton, Cambs CB1 6LD*

Micro: *BBC Model B*
Adventure: *Adventure Quest*
Problem *How to get past the giant and pass the bending tree branches. Also how to get past the spider in colossal adventure*
Name: *Nick Durlow*
Address. *Langleigh Country Hotel, Langleigh Road, Ilfracombe N Devon EX34 8EA*

Micro: *Spectrum*
Adventure. *Mountains of Ket*
Problem *I've reached the base of the crumbling cliff but I can't find a way onto the mountain!*
Name. *Mr C Jennings*
Address *26 Albert Road, Tonbridge, Kent TN9 2SR*

Micro *Commodore 64*
Adventure *Twin Kingdom Valley*
Problem. *How to get past the dragon and the witch in the desert king's castle*
Name: **M. W. Griffiths**
Address **1 Northwood Road, Prenton, Birkenhead, Merseyside, L43 0SN**

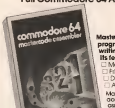
Micro *Commodore Vic 20*
Adventure: *Pirate Cove (Scott Adams)*
Problem *How to get rid of snakes who are guarding ★Doubleons★ on Treasure Island*
Name *Mr D Holland*
Address *121C Durants Road, Enfield, Middx EN3 7DG*



Mastercode Assembler
for the Commodore 64

Full Commodore 64 Assembler/Disassembler

£14.95 inc VAT



Mastercode is a substantial and complex program of use to anyone interested in writing machine code on the Commodore 64. Its features include:

- ☐ Machinecode monitor
- ☐ File Editor
- ☐ Disassembler
- ☐ Assembler

Mastercode is a full two pass assembler. It accepts labels, variables and equations within assembly language programs. It is possible to store programs anywhere in memory, even in parts occupied by the Assembler. Programs can be saved to either tape or disc.

The Machine Code Monitor includes:

■ OUTPUT OF MEMORY TO SCREEN OR PRINTER ■ MODIFICATION OF MEMORY ■ EXECUTION OF MACHINE CODE PROGRAMS ■ SAVING OF MACHINE CODE FILES ON TO TAPE OR DISC ■ LOADING OF MACHINE CODE FILES FROM TAPE OR DISC ■ STEP BY STEP TRACING OF THE EXECUTION OF A MACHINE CODE PROGRAM INCLUDING DISPLAY OF REGISTER CONTENTS

The Disassembler will translate into assembly language the contents of any area of memory, whether the 64's ROM or a user program. Output may be sent either to the screen or a printer.

The File Editor includes:

■ ENTRY OF NUMBERED LINES OF ASSEMBLY LANGUAGE INSTRUCTIONS ■ LISTING INDIVIDUALLY OR IN BLOCKS OF PREVIOUSLY ENTERED LINES ■ DELETION INDIVIDUALLY OR IN BLOCKS OF EXISTING LINES ■ RENUMBERING OF EXISTING LINES ■ SAVING OF ASSEMBLY LANGUAGE FILES TO TAPE OR DISC ■ LOADING OF ASSEMBLY LANGUAGE FILES FROM TAPE OR DISC ■ ADDITION OF A BLOCK OF MEMORY SPECIFIED BY THE USER TO THE USER'S ASSEMBLY PROGRAM

The Assembler allows the translation of assembly language programs into machine code with full error checking, labelling and a range of assembler directives.

LOOK OUT FOR THE SUNSHINE RANGE IN W H SMITH'S, BOOTS, JOHN MENZIES, OTHER LEADING RETAIL CHAINS AND THROUGH OUR NATIONAL NETWORK OF BOOK SHOPS AND SPECIALIST STORES

Please send me ______ Commodore 64 Mastercode Assembler @ £14.95 inc VAT. I enclose cheque/postal order for £ ______ made payable to Sunshine, 12/13 Little Newport Street, London WC2R 3LD. Or telephone your order through Access/Mastercard on 01 437 4343

Name ______

Address ______

______

______

Signature ______

New Releases

BULL RING

In *Knight's Quest* Phipps Associates produced one of the most enduring graphic adventures yet seen. They followed it up with other excellent adventures. Recently, however, all I have seen from the company are arcade style games — this is true of its latest batch.

Bull Run is a little like those sheep herding games although with more gore. You must lure a rogue bull into the bullring by enticing it to follow you and gradually sealing off all its exits. Credit then for being original.

However, the game looks like it is written in Basic — in fact it's compiled so it has machine code speed — all the characters are small and all the shapes are simple. It really does not match up to the sophisticated sprite graphics offering from Quicksilva or Ultimate. More adventures please Phipps.

Program	*Bull Run*
Price	*£5 95*
Micro	*Spectrum*
Supplier	*Phipps Associates 172 Kingston Road Ewell Surrey KT19 0SD*

SEWER RATS

I realise that rats are not everybody's favourite animals but I think the plot of *Rat Splat* is carrying things a little far, especially as this is the Chinese Year of the Rat.

This charming game has you chasing rats down a sewer to stop them from stealing cheese — how? By thumping them with a hammer of course — the Splat in the title.

Killing the rats upsets a sewer monster (good for him) who chases you but who can be warned off by an aerosol spray — but you must be quick because poisonous gas builds up which can kill you.

Unfortunately, the game is very addictive and one of the best I have seen on the Oric, so against my better judgement I recommend it.

Program	*Rat Splat*
Price	*£7 95*
Micro	*Oric 1*
Supplier	*Tansoft Units 1 and 2 Techno Park Newmarket Road Cambridge*

EGG CRUSHING

Falcon Patrol was more or less the best game Virgin ever released, so there is bound to be some interest in *Hideous Bill and the Gi Gants*.

After the Vietnam style scenario of Falcon — all exploding fuel dumps and screaming motors it's nice to see that the new game is only averagely violent — it involves pitting Mr Hideous against all kinds of obstacles to find his true love, Greta.

This involves three screens of difficult and incomprehensible action. In the first ants are going to eat Greta and Bill must crush all their eggs (presumably this makes them so depressed they are put off their food).

The next screen requires you to slot together a lever and socket to open and close two central doors — this gives you a chance to trap the Gi Gants. Again you have to travel around the screen crushing eggs. The third screen similarly features egg crushing except now you can barge your way through various gaps in the walls to get at the eggs. Stomp on the lot and Greta is yours.

In case you hadn't realised it yet what we have here is a highly evolved, permutated version of Pacman, but nevertheless it's very addictive. Like *Falcon Patrol* the use of sound is superb.

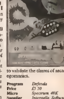
Program	*Hideous Bill and the Gi-Gants*
Price	*£7 95*
Micro	*Commodore 64*
Supplier	*Virgin Games 61/63 Portobello Road London W11 3DD*

ARCADE ORIGINAL FEATURES

A few months ago every other phone call I received was from Spectrum owners asking where they could obtain a copy of *Defender*. Evidently one or two versions appeared because the phone calls stopped. However one of the best I have seen has just been released by a new company called Interstella software.

Its game, *Defenda* has all the features of the arcade original, including humanoids to be rescued for bonus points. The game also has a radar screen showing the numbers of baddies you have to deal with.

The graphics are simple but effective and the screen scrolling is smoothly done. The game is compatible with the Sinclair interface 2 (one of the few which are) and Kempston. The manufacturers have even included a high score table which generates special codes to validate the claims of arcade egomanics.



Program	*Defenda*
Price	*£5 50*
Micro	*Spectrum 48K*
Supplier	*Interstella Software 82 New Forest Drive Brockenhurst*

LEAKING PIPES

Elusive and vaguely arrogant they may be, but I wonder if Spectrum owners realise how much gratitude Ultimate Play the Game are owed for raising the standard of Spectrum software.

After Ultimate's first couple of programs everyone saw what sort of graphics they ought to expect from the Spectrum and any software house with a reputation to maintain had to ensure they could match them.

Softek has always had a good reputation for software but *Microbot* is perhaps its best yet. Even a cursory glance at the program would force most people to agree that, graphically at least, it owes much to Ultimate.

The graphics are large and move smoothly — I particularly like the leaking pipes. The game itself is also addictive, you control a little robot trying to prevent nasty bugs from destroying the brain cells of a QT series robot (you mean you've been able to get one?)

Each bug must be destroyed with a fixative of the appropriate colour — in play it reminds me of *Psst*. Clear one area of bugs and you can be transported to the next. If you liked games like *Cookie* and *Psst* you should enjoy this.

Program	*Microbot*
Price	*£5 95*
Micro	*Spectrum*
Supplier	*Softek International 12/13 Henrietta Street London WC2E 8LH*

LINE GRAPHICS

Compusense, the Dragon software house is building on the success of it's *Edit+* and *Hires* cartridges with *Graphdrawer*.

This utility program, which has to be used with one of the

above, allows you to construct line graphs, histograms and bar charts — the results can then be dumped to any Epson or Seikosha printer

The program is easy to use with a simple menu selection of graph type and labels You can enter the data for your graphs in several ways, either directly from the menu or via a saved data file, or via a simple instruction from your own *Basic* programs Suitable scaling for the graphs is done automatically

Program	*Graphdrawer*
Price	*£9 95*
Micro	*Dragon 32*
Supplier	*Compusense* *PO Box 169* *286D Green Lanes* *London N13 5TN*

CAMPAIGN AREA

After releasing some strategy games based on unusual themes like gangsters and farmers CCS has returned to the classic area for strategy — wargames

War 70 depicts a Napoleonic struggle where the player/general makes decisions both about general campaign objectives and specific battle warfare

The program operates with two scales of map — a large one depicting the whole European campaign area and a smaller one of the specific battlefield when a confrontation occurs

The objective of the game is to capture your opponents capital and remain there for three days There are countless considerations in playing the game — attack or retreat, level of casualties, moral, etc. and consequently it can last for days — fortunately there is a *Save* facility

Program	*War70*
Price	*£6 00*
Micro	*Spectrum*
Supplier	*Cases Computer Simulations* *14 Langton Way,* *Blackheath* *London SE3 7TL*

DRAGON UTILITY

Sprite Magic is an excellent Dragon utility from Merlin Microsystems As the name suggests it provides Sprites for your Dragon

Sprites are the reason that Spectrum games have got so good recently, with smooth character movement and big shapes It ought to be a reason for considerable improvement in Dragon games

The problem is that many programs that call themselves sprite programs are nothing more than a 'multi print position mover' True sprites are independent graphic objects that can be set in motion with a single command and return a special value when they hit one another — this is what you get with *Sprite Magic*

In fact the program has more features than some built in sprite systems — there is an excellent feature called *Mazeon* which enables you to construct a maze around which sprites will travel, you can also set up another sprite from which they will run away Does it remind you of a certain arcade game?

Although lengthy, the documentation is clear and reasonably easy to understand The program comes with several demos which produce results that are superb There should be no excuse for appalling Dragon games again

Program	*Sprite Magic*
Price	*£17 25*
Micro	*Dragon 32*
Supplier	*Merlin Microsystems* *93 High Street* *Eston* *Middlesborough* *Cleveland TS6 9JD*

PATRONISING

Whilst applauding CCS for acknowledging the existence of an otherwise largely ignored market I am afraid its solution to the problem of getting more women interested in computer programs will only make things worse

Its Games for Girls series are programs (mainly adventures) with nasty pink inserts and such unbelievably patronising blurb as " it will particularly appeal to girls because the graphics are bright and colourful and the monsters do not appear!"

You don't have to be camping outside Greenham Common to find that fairly idiotic and patronising Women will not respond well to manufacturers who treat them as though they were retarded.

The game itself is OK being a single key press adventure The problem with it is, that there is not enough variation and I suspect its appeal would quickly pall

Program	*Diamond Quest*
Price	*£6*
Micro	*Spectrum 48K*
Supplier	*Cases Computer Simulations* *14 Langton Way,* *Blackheath* *London SE3 7TL*

CONTINENTAL

Computer owners with a culinary leaning (most of the ones I know live on take aways) could find a range of programs from P M C S useful All are concerned with using your Spectrum to choose recipes

Each program in the series covers a different kind of food — continental, quick cook, wholemeal, etc , with 70 different recipes

The idea is that you search your cupboards for what ingredients you have (up to five can be inputted) and the computer searches through its list of all the programs it knows featuring those combinations

Assuming you find something you like the computer will then work out the amounts of each ingredient necessary for each person and will give you cooking temperatures in centigrade or gas marks.

Program	*The Computer Cook book*
Price	*£5 95* *(£14 95 for set of three)*
Micro	*Spectrum 48K*
Supplier	*P M C S* *Station House* *Pickhill* *Thirsk* *North Yorkshire*

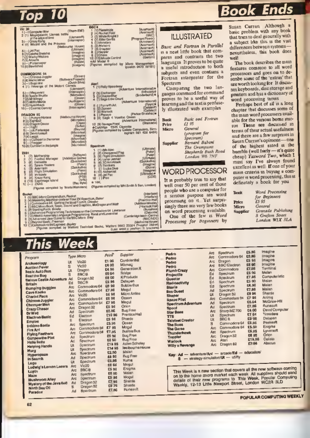
BOOGIE DOWN

If you have a BBC B with a 1.20 operating system and an ear for music you may be interested in two cassettes from Broadway Electronics They are entitled *Broadway Boogie and Classics I and II*

As you might expect they are the BBC B equivalent of those 'best of' records The programs are all written in Basic and you are encouraged to break onto them to see how the tunes were done The cassettes come with some instructions on how to get the most for the sound output by linking it to Hi-Fis, etc

Program	*Boogie and Classics*
Price	*£4 95*
Micro	*BBC B 1.20/S*
Supplier	*Broadway Electronics* *1 The Broadway* *Bedford*

New Releases is designed to let people know what software is coming on to the market. If you have a new game or utility which you are about to release send a copy and accompanying details to New Releases, Popular Computing Weekly, 12-13 Little Newport Street, WC2R 3LD



Vic 20
1 (—) Computer War (Thorn-EMI)
2 (1) Megagalactic Llamas battle at the edge of time (Llamasoft)
3 (—) Crazy Kong (Interceptor)
4 (8) Wizard and the Princess (Melbourne House)
5 (—) Jet Pac (Ultimate)
6 (7) Catcha Snatcha (Imagine)
7 (3) Wacky Waiters (Imagine)
8 (5) Arcadia (Imagine)
9 (—) Paratrooper (Rabbit)
10 (6) Bewitched (Imagine)

COMMODORE 64
1 (—) Chinese Juggler (Ocean)
2 (4) Manic Miner (Software Projects)
3 (—) Bugaboo (Quick Silva)
4 (1) Revenge of the Mutant Camels (Llamasoft)
5 (—) Megawarz (Interceptor)
6 (6) Space Shuttle (Microdeal)
7 (2) Mr Wimpy (Ocean)
8 (7) Motor Mania (Audiogenic)
9 (5) Hunchback (Ocean)
10 (—) Cosmic Convoy (Interceptor)

DRAGON 32
1 (—) Hungry Horace (Melbourne House)
2 (2) Eightball (Microdeal)
3 (8) Dragon Chess (Oasis)
4 (—) Ugh! (Softek)
5 (—) Up Periscope (Beyond)
6 (6) Devil Assault (Microdeal)
7 (4) Leggit (Imagine)
8 (—) Cuthbert in the mines (Microdeal)
9 (—) Frogger (Microdeal)
10 (8) Cuthbert in the jungle (Microdeal)

ZX81
1 (7) Mothership (Softeyne)
2 (1) Football Manager (Addictive Games)
3 (8) Defender (Quicksilva)
4 (6) Space Raiders (Psion)
5 (3) Asteroids (Quicksilva)
6 (2) Flight Simulation (Psion)
7 (8) Invaders (Quicksilva)
8 (4) Krazy Kong (PSS)
9 (10) Espionage Island (Artic)
10 (—) ZXAS (Bug Byte)
(Figures compiled by [illegible]/Websters)

Books
1 (1) BBC Micro Compendium, Ruston (Interface)
2 (4) Mastering Machine-code on Your ZX Spectrum, *Baker* (Interface)
3 ( ) Commodore 64: Getting the Most From It, *Cooke* (Prentice-Hall)
4 ( ) BBC Micro Book: Basic, Sound and Graphics, *McGregor and Watt* (Addison Wesley)
5 (9) Starting Forth, *Brodie* (Prentice Hall)
6 ( ) Advanced Programming Techniques on the Commodore 64, *Lawrence* (Sunshine)
7 (10) 68000 Assembly Language Programming, *Kane and Leventhal* (Osborne)
8 (2) Advanced User Guide for the BBC Micro, *Bray* (Cambridge Micro Centre)
9 ( ) Beyond Basic, *Freeman* (BBC/NEC)
10 ( ) Commodore 64 Exposed, *Bayley* (Melbourne House)
(Figures compiled by Watford Technical Books, Watford 0923 23324 Prestel 28844)
(Last week's position in brackets)

BBC*
1 (1) Planetoids (Acornsoft)
2 (4) Rocket Raid (Acornsoft)
3 (5) White Knight II (BBC)
4 (7) Killer Gorilla (Program Power)
5 ( ) Monsters (Acornsoft)
6 (2) Meteors (Acornsoft)
7 (3) Snapper (Acornsoft)
8 ( ) Hopper (Acornsoft)
9 ( ) Chess (Acornsoft)
10 (10) Missile Control (Gemini)
*All Model B
(Figures compiled by Micro Management, Ipswich 0473 59181)

Atari
1 (1) Rally Speedway (Adventure International)*
2 (3) Enchanter (Infocom)†
3 ( ) Choplifter (Broderbund)*
4 ( ) Saga 5 the Count (Adventure International)[illegible]
5 ( ) Fun with Art (Epyx)*
6 (2) Zaxxon (Datasoft)[illegible]
7 (6) Warlock (Calisto)†
8 ( ) Popeye (Parker Brothers)[illegible]
9 (4) Saga 4 Voodoo Castle (Adventure International)[illegible]
10 (9) Savage Pond (Starcade)
*Cartridge †32K Cassette
(Figures compiled by Calisto Computers, Birmingham 021 632 6458)

Spectrum
1 (1) Atic Atac (Ultimate)
2 (2) Chequered Flag (Psion)
3 (3) Flight Simulation (Psion)
4 (4) Lunar Jetman (Ultimate)
5 (6) 3D Ant Attack (Quicksilva)
6 (7) Stonkers (Imagine)
7 ( ) Scuba Dive (Durell)
8 (10) Alchemist (Imagine)
9 (9) Jet Pac (Ultimate)*
10 ( ) Pool (CDS)
* 16K
(Figures compiled by WH Smith & Son, London)

ILLUSTRATED

Basic and Fortran in Parallel is a neat little book that compares and contrasts the two languages. It proves to be quite a useful introduction to both subjects and even contains a Fortran interpreter for the Spectrum.

Comparing the two languages command for command proves to be a useful way of learning and the text is profusely illustrated with examples.

Book	*Basic and Fortran*
Price	*£1.95*
Micro	*General (program for Spectrum)*
Supplier	*Bernard Babani, The Grampians, Shepherds Bush Road, London W6 7NF*

WORD PROCESSOR

It is probably true to say that well over 50 per cent of those people who use a computer for a serious purpose are word processing on it. Yet surprisingly there are very few books on word processing available.

One of the few is *Word Processing for Beginners* by Susan Curran. Although a basic problem with any book that tries to deal generally with a subject like this is the vast differences between systems—nevertheless, this book does well.

The book describes the main features common to all word processors and goes on to describe some of the 'extras' that are worth looking for. It discusses keyboards, disc storage and printers and has a dictionary of word processing terms.

Perhaps best of all is a long chapter that discusses some of the main word processers available for the various home micros. These are discussed in terms of their actual usefulness and there are a few surprises in Susan Curran's opinions—one of the highest rated is the humble (well fairly—it's quite cheap) *Tasword Two*, which I must say I've always found excellent as well. If one of your main criteria in buying a computer is word processing, this is definately a book for you.

Book	*Word Processing for Beginners*
Price	*£5.95*
Micro	*General*
Supplier	*Granada Publishing, 8 Grafton Street, London W1X 3LA*

This Week

Program	Type	Micro	Price	Supplier
Archaeology	Ut	Vic20	£1.95	Confidential
Auction Fever	S	Vic20	£4.00	Mikmag
Basic Auto Run	Ut	Dragon	£4.95	Generation X
Beat the Bug	S	BBC B	£9.64	Bridge
Belvue Castle Adventure	Ad	Dragon 32	£8.00	K Products
Britain	Ed	BBC B	£5.95	Datapen
Bumping Buggies	Arc	Commodore 64	£6.99	Bubble Bus
Cave Kooks	Arc	Commodore 64	£7.95	Mogul
Chariot Race	Arc	Vic20	£6.95	Micro Antics
Chinese Juggler	Arc	Commodore 64	£6.90	Ocean
Chomper Man	Arc	Commodore 64	£7.95	Mogul
Crazy Chaser	Arc	Dragon 32	£5.95	Orion
Dr Wiz	Ad	Spectrum	£5.95	Bug Free
Electron Basic	Ed	Electron	£10.95	Prentice Hall
Empire	S	Electron	£5.95	Shards
Eskimo Eddie	Arc	Spectrum	£5.95	Ocean
Fire Ant	Arc	Commodore 64	£7.95	Mogul
Flying Feathers	Arc	Commodore 64	£7.95	Bubble Bus
Gunpowder Plot	Ad	Spectrum	£5.90	Bug Free
Hello Bells	Ad	Spectrum	£5.50	Bug Free
Helping Hands	Ut	Spectrum	£13.95	Aslen Scholey
Hurg	Ut	Spectrum	£14.95	Melbourne House
Hyperspace	Arc	Spectrum	£2.50	Malan
In Search	Ad	Spectrum	£4.90	Bug Free
Logo	Ut	Spectrum	£5.95	Kuma
Ludwig's Lemon Lasers	Arc	Vic20	£8.64	Mogul
Lupin	Arc	BBC B	£5.90	Enigma
Maze	Arc	Spectrum	£5.00	Malan
Mushroom Alley	Arc	Spectrum	£5.95	Mogul
Mystery of the Java Star	Ad	Dragon 32	£7.95	Shards
North Sea Oil	S	Dragon 32	£6.75	Shards
Paradox	Ad	Spectrum	£7.95	Runesoft
Pedro	Arc	Spectrum	£5.95	Imagine
Pedro	Arc	Commodore 64	£5.95	Imagine
Pedro	Arc	Dragon	£5.95	Imagine
Pedro	Arc	BBC/Electron	£6.95	Imagine
Plumb Crazy	Arc	Commodore	£7.95	Terminal
Projectile	Ed	Spectrum	£5.00	Malan
Questar	Ed	Spectrum	£7.95	Computeristic
Radioactivity	Ed	Spectrum	£5.00	Malan
Sharis	Ed	Spectrum	£4.90	Malan
Sea Quest	Ad	Spectrum	£7.95	Malan
Shaper	Ut	Dragon 32	£9.95	Shards
Space Pilot	Arc	Commodore 64	£7.95	Anirog
Spectrum Adventure	Ad	Spectrum	£6.04	McGraw-Hill
Spoof	Ad	Spectrum	£7.95	Runesoft
Star Base	Arc	Sharp MZ 700	£4.00	David Computer
TTS	Ut	Spectrum	£7.64	Timedata
Teletext Creator	Ut	BBC B	£9.98	Datapen
The Boss	S	Commodore 64	£5.95	Peaksoft
The Game	Arc	Commodore 64	£5.50	Enigma
Thunderhawk	Arc	Spectrum	£5.95	Lyversoft
Toppler	Arc	Dragon 32	£8.95	Orion
Warlock	Arc	Atari	£14.95	Calisto
Willy's Revenge	Arc	Dragon 32	£7.95	Abacus

Key: Ad — adventure/Arc — arcade/Ed — education/ S — strategy-simulation/Ut — utility

This Week is a new section that covers all the new software coming on to the home micro market each week. All suppliers should send details of their new programs to This Week, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD



Restricted supply?

I was not surprised to read that the Sinclair QL will not be generally available for several months

Sinclair have apparently yet again wildly underestimated the demand for their new brainchild

I say apparently because I have come to the conclusion that the delivery schedules are due not to any lack of foresight in estimating the likely demand; rather, they are part of the marketing strategy followed by many companies in the 'hi-tech' analogous to hi fi — consumer marketplace

The strategy is to launch the new product with as much razzamataz as possible creating a huge amount of media interest and thus ensuring that anyone even remotely interested will have heard of it. There will be a number of those who will immediately place their orders, in order to ensure they have the product first and are able to stay miles ahead of the Jones's. The company can then issue a press release, stating that they have taken X-thousand orders in the first week. This is duly splashed all over the following week's front pages, reinforcing the impression that this product is the best thing since sliced bread. After all, two thousand eager beavers can't be wrong, can they? Thus, a few thousand more people clip out the coupon from the glossy brochure, scrawl their Access number in the space provided, and send it off to the Freepost address

The next week's lead story is that the company have been swamped with orders — handsomely exceeding their widest estimates of likely demand. Thus the myth that the new product is set to take the world by storm is created. By the time those who ordered first are receiving their machines the software is beginning to get through to the shops and the monthly magazines with their three month lead times are publishing their first full reviews

Six months or so after the launch the initial euphoria has died down. This is the time to get the machine into the High Street stores, further boosting its sales by increasing its exposure and making it an acceptable purchase for those who will not buy by mail order. The company can then boast, hypocritically, that while you can pop round the corner and buy one of its machines the competition still has a long waiting list.

The really skilled practitioner of what could be termed supply manipulation-aided marketing (SMAM for short) can extent the technique to peripherals.

My whole argument rests on one basic assumption, that a company might deliberately restrict supply in order to create demand. How do I justify that assumption? Well, I find it very hard to believe production cannot be 'ramped up' (to use the current vogue jargon for 'increased') to meet the demand actually experienced. A modern micro is usually constructed on a single circuit board with a minimum of final assembly. Such a manufacturing process is, or should be, almost completely mechanised

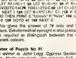
A final thought. Will Sir Clive and his fellow manufacturers go down in history as electronic geniuses or marketing pioneers?

Chris Boots

Hands up!

Puzzle No 96

Professor Otto Hex had returned from a mathematical convention in Moscow. "Attendance was up on last time," he commented. "I worked out that if every delegate shook hands with every other delegate there would be twice as many handshakes as there would have been if they had done the same thing last year."



He paused whilst I grappled with this piece of news. "I see," I replied. "Last year there were only 3 delegates resulting in 3 handshakes, and this year there were 4 delegates who would shake hands 6 times." "Don't be ridiculous," exclaimed the Professor. "Whoever heard of a convention with only four attending!

Let me say that last year there were more than 100 but less than 500 delegates attending."

Can you say what the attendances were for the two years?

Solution to Puzzle No 91

A program to find the number of reds and colours in this galactic snooker is

```
10 FOR C=8 TO 99 20 LET R=1 30 LET R1=1
40 LET R1=R1+1 50 LET R=R+R1 60 IF R>99
THEN GOTO 140 70 FOR I=2 TO C 80 LET C1=C1+
I 90 NEXT I 100 LET B=R*C+R+ C1 110 IF B=
11702 THEN PRINT C "Colours" R "Reds" 120 LET
C1=0 130 GOTO 40 140 NEXT C
```

This gives the answer of 78 reds and 92 colours. Extraterrestrial eyesight is also presumably required to distinguish between the 92 different colours.

Winner of Puzzle No 91

The winner is John Legg, Cypress Gardens, Blyth, Northumberland, who receives £10



